



ERIE COUNTY, NEW YORK MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE

Draft

**REVISED DRAFT
FEBRUARY 2015**

PART 1 OF 2:
Main Text

Prepared by:

URS

Part 1 of 2: Main Text

Multi-Jurisdictional
Hazard Mitigation Plan Update
Erie County, New York

Draft

Prepared for



Erie County Emergency Services
45 Elm Street
Buffalo, NY 14203



1255 Broad Street, Suite 201
Clifton, New Jersey 07013-3398

Revised Draft – February 2015



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PLAN ADOPTION RESOLUTIONS

In accordance with Part 201.6 of the Disaster Mitigation Act of 2000 (DMA 2000), Erie County, New York, has developed this Update of its Multi-Jurisdictional Hazard Mitigation Plan to identify hazards that threaten the County and ways to reduce future damages associated with these hazards.

Following this page are the signed adoption resolutions of the County and all participating jurisdictions that have adopted this plan, authorizing municipal government staff to carry out the actions detailed herein.

Signed resolutions of adoption by all participating jurisdictions shall be inserted following this page after FEMA has reviewed and determined that the Draft plan is approvable. It is recommended that municipalities in Erie County consider using the Sample Adoption Resolution from the FEMA Region 2 "Hazard Mitigation Plan Development Tool Kit CD", as shown below. Failure of any participating jurisdiction to ultimately adopt the plan and provide their adoption resolution to FEMA will result in a determination from FEMA that such jurisdiction has not successfully met the requirements of DMA 2000 and that the community does not have a plan "in place".

SAMPLE ADOPTION RESOLUTION
<p><i>Note: This sample plan adoption resolution has been extracted from FEMA Region 2's "Hazard Mitigation Plan Development Tool Kit" CD (April 2009). It is recommended that municipalities in Erie County consider using this resolution when adopting the Final Plan.</i></p>
<p>(Name of Jurisdiction) <u>Town A</u></p>
<p>(Governing Body) <u>Town Council</u></p>
<p>(Address) <u>100 Main Street, Town A</u></p>
<p>RESOLUTION</p> <p>WHEREAS, <u>Town A</u>, with the assistance from URS Corporation, has gathered information and prepared the Erie County, New York, Multi-Jurisdictional Hazard Mitigation Plan Update ("the Plan"); and</p> <p>WHEREAS, the Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and</p> <p>WHEREAS, <u>Town A</u> is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and</p> <p>WHEREAS, <u>Town A</u> has reviewed the Plan and affirms that the Plan will be updated no less than every five years;</p> <p>NOW THEREFORE, BE IT RESOLVED by <u>Town Council</u> that <u>Town A</u> adopts the <u>Erie County, New York, Multi-Jurisdictional Hazard Mitigation Plan Update</u> as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.</p> <p>ADOPTED this <u>(date)</u> day of <u>(Month)</u>, <u>(year)</u> at a meeting of the <u>Town Council</u>.</p> <p>_____ (Mayor)</p> <p>_____ (Clerk)</p>

EXECUTIVE SUMMARY

Across the United States and around the world, natural disasters occur each day, as they have for thousands of years. As the world's population and development have increased, so have the effects of these natural disasters. The time and money required to recover from these events often strain or exhaust local resources. **Hazard mitigation** is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. Hazard mitigation is best realized when community leaders, businesses, citizens, and other stakeholders join together in an effort to undertake a process of learning about hazards that can affect their area and use this knowledge to prioritize needs and develop a strategy for reducing damages. The purpose of hazard mitigation planning is to identify policies, actions, and tools for implementation that will, over time, work to reduce risk and the potential for future losses. Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act ("the Stafford Act"), enacted by Section 104 of the Disaster Mitigation Act of 2000 ("DMA 2000"), provides new and revitalized approaches to mitigation planning. Section 322 continues the requirement for a State mitigation plan as a condition of disaster assistance, and establishes a new requirement for local mitigation plans. In order to apply for Federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with DMA 2000 and its implementing regulations (44 CFR Part 201.6).

While Erie County has always sought ways to reduce their vulnerability to hazards, the passage of DMA 2000 helped County officials to recognize the benefits of pursuing a long-term, coordinated approach to hazard mitigation through hazard mitigation planning. Erie County recognized early on the benefits of having a plan in place, and took the initiative to prepare its initial Hazard Mitigation Plan in 2004. This plan was later approved by FEMA in 2005. To maintain their eligibility to apply for FEMA mitigation project grants, the plan must be updated and re-approved by FEMA on a five-year cycle. This marks the first of the plan's formal updates since its inception.¹

This **Erie County Multi-Jurisdictional Hazard Mitigation Plan Update** represents the collective efforts of the county and 42 fully participating jurisdictions, the general public, and other stakeholders. It has been developed by the Erie County Hazard Mitigation Planning Team (the "Planning Team"), with support from outside consultants. The efforts of the Planning Committee were headed by Gerard Whittington, Deputy Commissioner of Erie County Department of Emergency Services (ECDES). The Planning Committee was supplemented by a Core Planning Group (CPG) and Jurisdictional Assessment Teams (JATs), with one JAT for each of the County's participating jurisdictions. The plan update process was initiated in earnest in the summer of 2011 with the project initiation meeting between ECDES and its consultant, held on June 20, 2011. A Kickoff Meeting of the full Core Planning Group was conducted on August 24, 2011. Thereafter, the Core Planning Group met on October 19, 2011. The Draft Plan Update was released in April 2012. It was discussed at open public meetings of the Disaster Preparedness Advisory Board (DPAB²) on July 24, 2012; September 25, 2012; November 26, 2013; and January 28, 2014. Municipal JATs met individually throughout the plan development process as they each deemed

¹ The 2005 version of this hazard mitigation plan was effective from May 2005 to May 2010. The County was unable to initiate the first required update with its own resources. The County applied for, and ultimately received, a FEMA mitigation planning grant to fund this update. Thereafter, a Request for Proposal was released on July 12, 2010. Proposals were submitted on July 30, 2010. On review, the County selected URS. The County executed a contract with URS on June 1, 2011; and URS received a notice to proceed on June 3, 2011. A draft plan was submitted on April 12, 2012. Agency review comments on the April 2012 draft were provided to URS on October 21, 2013. Many comments required municipal and/or action in order to address appropriately. URS received the last batch of jurisdictional revisions on August 26, 2014. At that time, conflicting needs on other projects (unforeseen in 2011) precluded URS from achieving the targeted 60 day turnaround in its scope of work (October 26, 2014) for comment incorporation, and independent technical review for quality. This revised draft was submitted by URS to ECDES for agency review in November 2014, on the date appearing on this document's cover and title page.

² The DPAB is a volunteer board. One third of the members are active members of voluntary fire companies and the remainder are elected officials or their representatives, representatives of organizations involved in civil defense and disaster preparedness and other citizens of the county.

necessary. Following FEMA's review and approval of the draft plan update, a public meeting will be held to present the final document to County Legislators and the public prior to its formal adoption. This will also occur at the municipal level for each participating jurisdiction (most likely as agenda items at regularly scheduled board/council meetings), subsequent to FEMA's approval.

Community support is vital to the success of any hazard mitigation plan. The Planning Committee provided opportunities for participation and input of the public and other stakeholders throughout the plan development process, both prior to this Draft and before approval of the Final plan update, providing citizens and other stakeholders with opportunities to take part in the decisions that will affect their future. On a mitigation planning section of the ECDES web site³, ECDES posted information on the plan development process and where to go for additional information or comments beginning in the summer of 2011; this web site has been and continues to be maintained and updated regularly. A link to this information also appeared on many of the municipal web sites. The County also conducted numerous other outreach actions throughout the planning process. The public and other stakeholders were apprised of the hazard mitigation planning process through the mitigation planning website; via the posting of the project fact sheet in various public buildings across the County; informational letters to stakeholders mailed by ECDES in August 2011; a stakeholders information session (in conjunction with the plan update kickoff meeting) held on August 24, 2011; information presented at various County and municipal board meetings throughout the course of the project; and several newsletter/newspaper articles. ECDES also made efforts to speak of the mitigation planning process during other regularly-scheduled public presentations on emergency preparedness initiatives. Jurisdictional Assessment Team members supplemented County efforts by reaching out to the public and other stakeholders within their respective jurisdictions to get the word out through various means and provide opportunities for feedback and participation.

The hazard mitigation planning process consisted of the following key steps:

- Researching a full range of hazards to identify which hazards could affect the County;
- Identifying the location and extent of hazard areas;
- Identifying assets located within these hazard areas;
- Characterizing existing and potential future assets at risk;
- Assessing vulnerabilities to the most prevalent hazards; and
- Formulation and prioritization of goals, objectives, and mitigation actions to reduce or avoid long-term vulnerabilities to the identified hazards.

After evaluating the County's hazards and assets within the County to which they are vulnerable, the Planning Team developed a mitigation strategy to increase the disaster resistance of the County, along with procedures for monitoring, evaluating and updating the Plan to ensure that it remains a "living document." Natural disasters cannot be prevented from occurring. However, over the long-term, the continued implementations of this Plan will gradually, but steadily, lessen the impacts associated with hazard events.

This Draft Plan Update is currently under review by the Planning Team, the New York State Emergency Management Office (NYSEMO), Federal Emergency management Agency (FEMA), and the public and other stakeholders. Later, comments will be incorporated, and the County and all participating jurisdictions will each formally adopt the Final Plan. The Final Plan will include copies of adoption resolutions following Page i. If you have any questions or comments on the Multi-Jurisdictional Hazard Mitigation Plan Update for Erie County, New York, additional information can be obtained by contacting your local municipality or: Gregory Butcher, Deputy Commissioner, Erie County Department of Emergency Services, 45 Elm Street, Buffalo, New York 14203 (phone: (716) 858-2944; e-mail: gregory.butcher@erie.gov).

³ <http://www2.erie.gov/disaster/index.php?q=http%3A//www2.erie.gov/disaster/index.php%3Fq%3DMulti%20Hazard%20Mitigation%20Plan%20old>

ACKNOWLEDGEMENTS

Throughout the plan development process, ECDES worked tirelessly to involve all of its 44 municipalities. These local jurisdictions were not only invited to participate but were truly guided through the process by ECDES and its consultant at every stage.

All of the County's municipalities participated in, and were covered by, the earlier 2005 version of the plan. The following municipal entities (Erie County and 42 of its constituent municipalities) participated successfully in the update of this plan by attending meetings and submitting the key deliverables:

Erie, County of

<i>Akron, Village of</i>	<i>Concord, Town of</i>	<i>Lancaster, Village of</i>
<i>Alden, Town of</i>	<i>Depew, Village of</i>	<i>Marilla, Town of</i>
<i>Alden, Village of</i>	<i>East Aurora, Village of</i>	<i>Newstead, Town of</i>
<i>Amherst, Town of</i>	<i>Eden, Town of</i>	<i>North Collins, Town of</i>
<i>Angola, Village of</i>	<i>Elma, Town of</i>	<i>North Collins, Village of</i>
<i>Aurora, Town of</i>	<i>Evans, Town of</i>	<i>Orchard Park, Town of</i>
<i>Blasdell, Village of</i>	<i>Gowanda, Village of</i>	<i>Orchard Park, Village of</i>
<i>Boston, Town of</i>	<i>Grand Island, Town of</i>	<i>Sardinia, Town of</i>
<i>Brant, Town of</i>	<i>Hamburg, Town of</i>	<i>Sloan, Village of</i>
<i>Buffalo, City of</i>	<i>Hamburg, Village of</i>	<i>Springville, Village of</i>
<i>Cheektowaga, Town of</i>	<i>Holland, Town of</i>	<i>Tonawanda, City of</i>
<i>Clarence, Town of</i>	<i>Kenmore, Village of</i>	<i>Tonawanda, Town of</i>
<i>Colden, Town of</i>	<i>Lackawanna, City of</i>	<i>West Seneca, Town of</i>
<i>Collins, Town of</i>	<i>Lancaster, Town of</i>	<i>Williamsville, Village of</i>

The Village of Farnham and the Town of Wales opted not to participate in the plan update.

A more detailed summary of the participation demonstrated by each municipality in the County, including attendance at meetings and submission of requested deliverables, is presented in **Table 1.5**.

In addition, the records show that the following stakeholder entities participated by attending at least one meeting and/or by returning a signed Statement of Authority to Participate and keeping themselves apprised of the process through coordination with ECDES and regular review of information posted on the ECDES web site's hazard mitigation planning page.

American Red Cross
Erie County Department of Public Works
Erie County Department of Social Services
Erie County Disaster Preparedness Advisory Board
Erie County Local Emergency Planning Committee
National Grid
National Weather Service, Buffalo
New York State Department of Transportation
Niagara Frontier Transportation Authority
US Army Corps of Engineers, Buffalo District

URS Corporation (Clifton, NJ) acted as the plan development consultant providing hazard mitigation planning services and ultimately authoring this document.

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SECTION 1 - INTRODUCTION

Purpose

Erie County is susceptible to a number of different potential hazards - natural, technological, and human induced. These hazards have the potential to cause property loss, loss of life, economic hardship, and threats to public health and safety. While an important aspect of emergency management deals with disaster recovery – those actions that a community must take to repair damages and make itself whole in the wake of a disaster – an equally important aspect of emergency management involves hazard mitigation. Hazard mitigation measures are efforts taken *before* a disaster happens to lessen the impact that future disasters of that type will have on people and property in the community. They are things you do today to be more protected in the future. While Erie County has always sought ways to reduce their vulnerability to hazards, the passage of DMA 2000 helped County officials to recognize the benefits of pursuing a long-term, coordinated approach to hazard mitigation through hazard mitigation planning. Erie County recognized early on the benefits of having a plan in place, and took the initiative to prepare its initial Hazard Mitigation Plan in 2004. This plan was later approved by FEMA in 2005. To maintain their eligibility to apply for FEMA mitigation project grants, the plan must be updated and re-approved by FEMA on a five-year cycle. This marks the first of the plan's formal updates since its inception.⁴

This **Erie County Multi-Jurisdictional Hazard Mitigation Plan** (the “Plan”) has been developed by the Erie County Hazard Mitigation Planning Committee (the “Planning Committee”), with support from outside consultants at URS Corporation (“URS,” the contractor responsible for providing the Planning Committee with hazard mitigation planning support services). The Plan represents the collective efforts of citizens, elected and appointed government officials, business leaders, volunteers of non-profit organizations, and other stakeholders.

Through the development of this Plan, the Planning Committee has identified the various hazards that could affect the County, and has evaluated the risks associated with these hazards. The successful implementation of this Plan will make Erie County more disaster-resistant because the County has taken the initiative to recognize the benefits that can be gained by planning ahead and taking measures to reduce damages before the next disaster strikes. The Plan will also allow Erie County and participating jurisdictions to comply with the Disaster Mitigation Act of 2000 (DMA 2000) and its’ implementing regulations (44 CFR Part 201.6), thus resulting in eligibility to apply for Federal aid for technical assistance and post-disaster hazard mitigation project funding.

This plan is not intended to serve as a reference for immediate disaster response. This plan focuses on actions that can be implemented prior to disaster events in order to reduce potential loss of life and damage to property. It is also intended to assist the county and its municipalities in identifying and prioritizing mitigation opportunities immediately occurring after a major disaster. Disasters cannot be prevented from occurring. However, over the long-term, the continued implementation of this Plan will gradually, but steadily, lessen the impacts associated with hazard events.

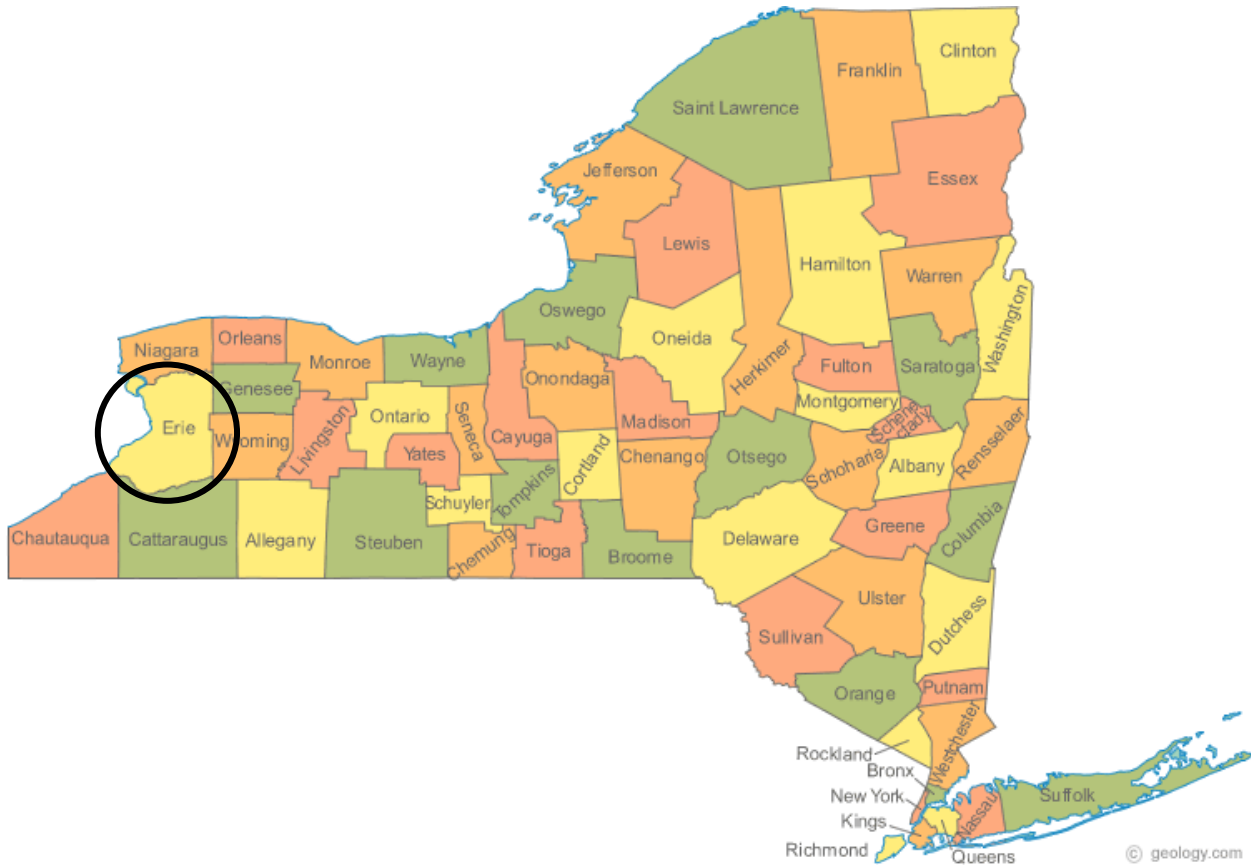
⁴ The 2005 version of this hazard mitigation plan was effective from May 2005 to May 2010. The County was unable to initiate the first required update with its own resources. The County applied for, and ultimately received, a FEMA mitigation planning grant to fund this update. Thereafter, a Request for Proposal was released on July 12, 2010. Proposals were submitted on July 30, 2010. On review, the County selected URS. The County executed a contract with URS on June 1, 2011; and URS received a notice to proceed on June 3, 2011. A draft plan was submitted on April 12, 2012. Agency review comments on the April 2012 draft were provided to URS on October 21, 2013. Many comments required municipal and/or action in order to address appropriately. URS received the last batch of jurisdictional revisions on August 26, 2014. At that time, conflicting needs on other projects (unforeseen in 2011) precluded URS from achieving the targeted 60 day turnaround in its scope of work (October 26, 2014) for comment incorporation, and independent technical review for quality. This revised draft was submitted by URS to ECDES for agency review in November 2014, on the date appearing on this document’s cover and title page.

About the County

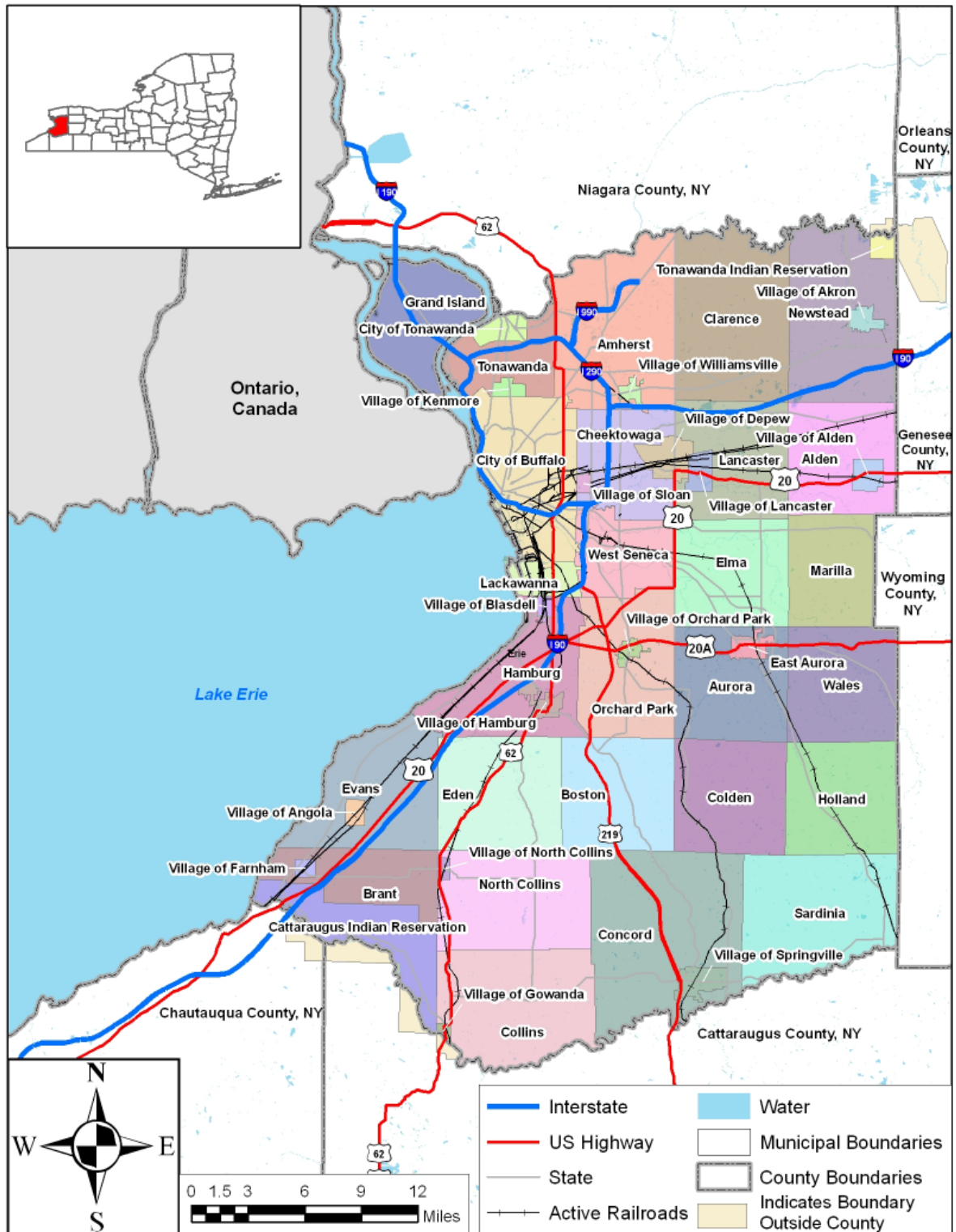
Overview

Erie County is located in the western part of New York State. The county is bounded by Lake Erie and Canada to the west, Niagara County to the north, Genesee and Wyoming County to the east, and Cattaraugus and Chautauqua Counties to the south. The county seat is the City of Buffalo. **Figure 1.1** depicts the location of Erie County in relation to the rest of New York State.

Figure 1.1 - Location of Erie County in New York State



Erie County is home to 44 incorporated municipalities (25 towns, 16 villages and three cities). They are the Towns of Alden, Amherst, Aurora, Boston, Brant, Cheektowaga, Clarence, Colden, Collins, Concord, Eden, Elma, Evans, Grand Island, Hamburg, Holland, Lancaster, Marilla, Newstead, North Collins, Orchard Park, Sardinia, Tonawanda, Wales and West Seneca; Villages of Akron, Alden, Angola, Blasdell, Depew, East Aurora, Farnham, Gowanda, Hamburg, Kenmore, Lancaster, North Collins, Orchard Park, Sloan, Springville and Williamsville; and Cities of Buffalo, Lackawanna and Tonawanda. The location and extent of all these municipalities, as well as significant highways are shown on the base map of the County in **Figure 1.2**.

Figure 1.2 – Base Map of Erie County

SOURCE: ESRI, U.S. Counties, 2005, New York Major Roads, 2000; Erie County Municipal Boundaries, Erie County Street Centerlines, 2010; U.S. Census Bureau, Census Railroads, New York State, 2001, Area Hydrography, NHD, USGS.

According to the US Census, the population of Erie County in 2000 was 950,265 whereas, in 2010 it was 919,040 – a decrease of approximately 3.3 percent in less than ten years. The New York Statistical Information System at Cornell University projects the County’s population to continue this trend with a steady decrease thereafter through 2040, down to a level of 769,396. **Table 1.1** shows key County population changes between 2000 and 2010 (county-wide and for each municipality) as reported by the US Census Bureau.

Table 1.1 Erie County Population Changes <i>(Source: US Census Bureau *)</i>		
Municipality	Census Population 2000	Census Population 2010
Erie, County of	950,265	919,040
Akron, Village of	3,085	2,868
Alden, Town of	10,470	10,865
Alden, Village of	2,666	2,605
Amherst, Town of	116,510	122,366
Angola, Village of	2,266	2,127
Aurora, Town of	13,996	13,782
Blasdell, Village of	2,718	2,553
Boston, Town of	7,897	8,023
Brant, Town of	1,906	2,065
Buffalo, City of	292,648	261,310
Cheektowaga, Town of	94,019	88,226
Clarence, Town of	26,123	30,673
Colden, Town of	3,323	3,265
Collins, Town of	8,307	6,601
Concord, Town of	8,526	8,494
Depew, Village of	16,629	15,303
East Aurora, Village of	6,673	6,236
Eden, Town of	8,076	7,688
Elma, Town of	11,304	11,317
Evans , Town of	17,594	16,356
Farnham, Village of	322	382
Gowanda, Village of	2,842	2,709
Grand Island, Town of	18,621	20,374
Hamburg, Town of	56,259	56,936
Hamburg, Village of	10,116	9,409
Holland, Town of	3,603	3,401
Kenmore, Village of	16,426	15,423
Lackawanna, City of	19,064	18,141
Lancaster, Town of	39,019	41,604
Lancaster, Village of	11,188	10,352
Marilla, Town of	5,709	5,327
Newstead, Town of	8,404	8,594
North Collins, Town of	3,376	3,523
North Collins, Village of	1,079	1,232
Orchard Park, Town of	27,637	29,054
Orchard Park, Village of	3,294	3,246
Sardinia, Town of	2,692	2,775
Sloan, Village of	3,775	3,661
Springville, Village of	4,252	4,296
Tonawanda, City of	16,136	15,130

Table 1.1
Erie County Population Changes
*(Source: US Census Bureau *)*

Municipality	Census Population 2000	Census Population 2010
Tonawanda, Town of	78,115	73,567
Wales, Town of	2,960	3,005
West Seneca, Town of	45,920	44,711
Williamsville, Village of	5,573	5,300

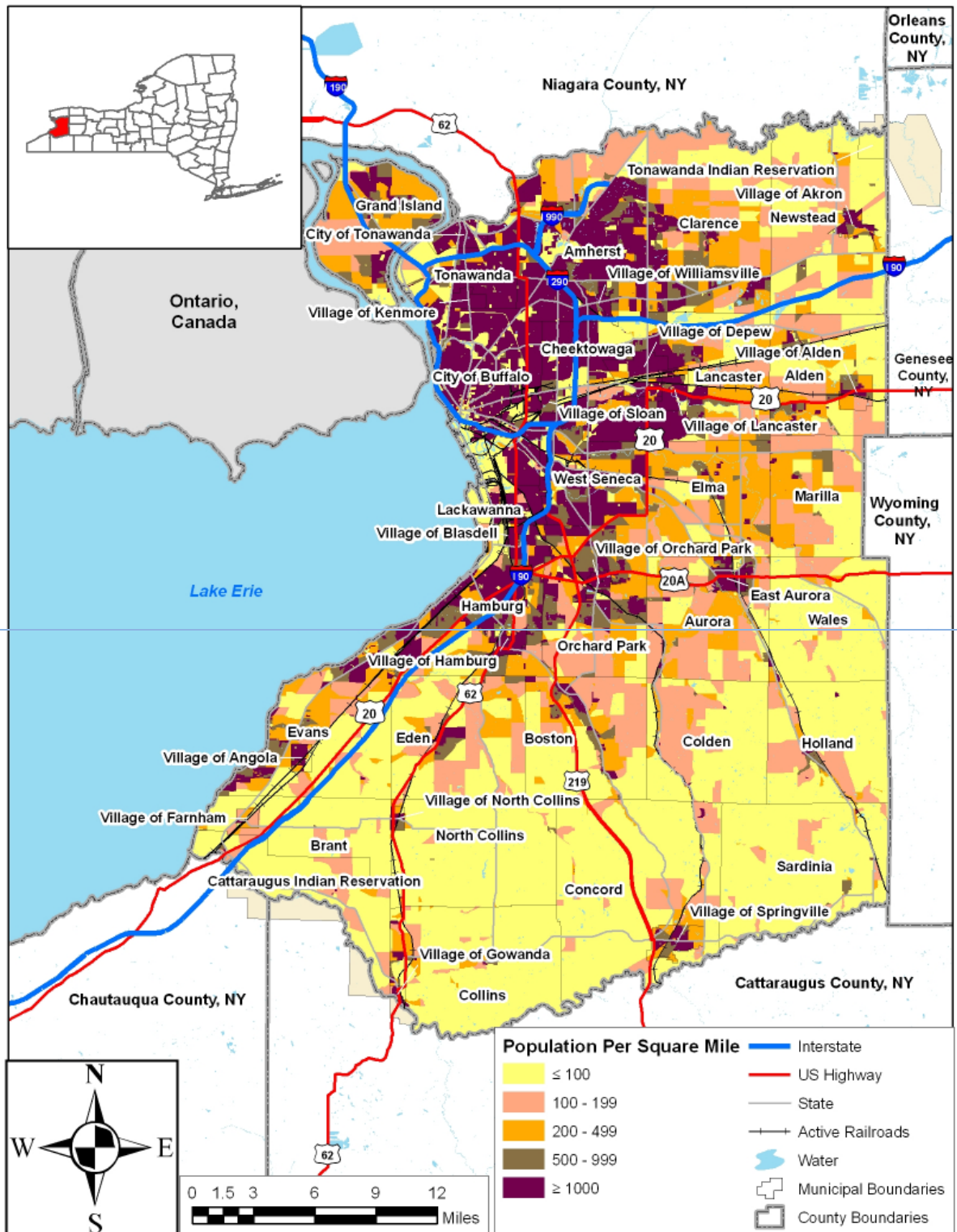
** County Totals shown above also include residents of the Cattaraugus and Tonawanda Reservations. Town totals include population of Villages within their respective borders.*

According to the U.S. Census Bureau, the county has a total area of 1,227 square miles, of which 1,044 square miles is land and 183 square miles is water. The County Parks Master Plan reports approximately 77 miles of shoreline along Lake Erie and the Niagara River.

The 2010 U.S. Census population density per square mile of land in Erie County is 880 persons per square mile; whereas, in the 2000 U.S. Census, there were 910 persons per square mile – a decrease of more than three percent in ten years. By 2040, the population density is projected to be 734 persons per square mile – a decrease of nearly 20 percent over the year 2010 values. The population of Erie County is mostly concentrated in the western regions of the County, nearest to the City of Buffalo. **Figure 1.3** shows population densities across the county.

The land use pattern that has existed for decades has led to the expansion of suburban towns and a mixed pattern of stability, decline, and re-development in the City of Buffalo. The northern towns of Erie County have experienced the greatest growth and the eastern towns are beginning to experience development pressures while the southern towns are developing at a slower pace. Recent trends show a progressive shift of population and households from the region's traditional urban centers toward more suburban and rural areas.

The overall median age in Erie County in 2010 has been estimated by the U.S. Census Bureau to be 40.4, up from 38.0 in 2000. The percentage of the County population over 65 years of age according to the US Census Bureau was 15.9 percent in 2000, with the Census Bureau estimating no significant change in 2010 (15.7 percent). The portion of the County population under 5 years of age was 6.1 percent in 2000, with the Census Bureau estimating a slight decrease to 5.3 percent in 2010.

Figure 1.3 – Erie County Population Density

SOURCE: ESRI, U.S. Counties, 2005; New York Major Roads, 2000; Erie County Municipal Boundaries, Erie County Street Centerlines, 2010; U.S. Census Bureau, Population Data, 2000, Census Railroads, New York State, 2001, Area Hydrography, NHD, USGS.

Income and Employment. The U.S. Census Bureau reports that between 2000 and 2010 median household incomes in Erie County exhibited a fractionally greater rise than the national average, while median family incomes exhibited a fractionally lesser rise than the national average, as shown in **Table 1.2**. In addition, the percentages of families and individuals below the poverty line increased at a slightly lower rate than the national figures, while unemployment increased at a slightly higher rate than the national figures.

Table 1.2 Income and Employment in Erie County <i>Source: U.S. Census Bureau</i>				
Economic Characteristic	2000		2010	
	Erie County	USA	Erie County	USA
Median Household Income	\$38,567	\$41,994	\$46,816	\$50,046
Median Family Income	\$49,490	\$50,046	\$59,474	\$60,609
Families Below Poverty Level	9.2%	9.2%	10.4%	11.3%
Individuals Below Poverty Level	12.2%	12.4%	14.4%	15.3%
Unemployed*	4.5%	5.8%	10.1 %	10.8%

*As a percentage of the population aged 16 years or more

Transportation Links. Erie County is well served by various forms of transportation. The New York State Thruway (I-90) passes through Erie County from the southwest to the northeast; this highway is the major interstate route in the region. Other interstate spur routes include: the Niagara Thruway (I-190), linking I-90 with Downtown Buffalo, Niagara Falls and Canada; the Youngmann Highway (I-290) passing through northwest Erie County and bypassing Downtown Buffalo to link I-90 and I-190; and the Lockport Expressway (I-990), passing northerly through the north-central section of Amherst linking to other area arterials and the City of Lockport in Niagara County. Other limited-access highways serving Erie County include: US 219, linking I-90 in the north with the Village of Springville to the south and passing through south-central Erie County; NY 400, linking I-90 in the north with East Aurora and South Wales in southeastern Erie County; and NY 5, NY 179, NY 198 and NY 33, which form a network of expressways within Buffalo and first-ring suburban towns. Major east-west state arterials in Erie County include: NY 5 and US 20 (both of which cross New York State from Erie, PA to Albany); NY 354 and US 20A, serving central Erie County; and NY 39, which crosses southern Erie County. Major north-south state arterials include: US 62, which passes from Niagara Falls through Buffalo to southwest Erie County; NY 240 and NY 277, serving north-central and southcentral Erie County; NY 16, which is a southern extension of NY 400 serving southeast Erie County and proceeding south to Olean; and NY 78, serving central Erie County and proceeding north through the City of Lockport to the Lake Ontario shore. Highway access to Canada is provided via the Peace Bridge, located one mile north of Downtown Buffalo and spanning the Niagara River between Buffalo and Fort Erie, Ontario. The Canadian terminus of the Peace Bridge is conveniently connected to the Queen Elizabeth Way (QEW), a limited-access highway serving Niagara Falls (ONT), St. Catharines, Hamilton and Toronto. Additional highway access to Canada is available via three other bridges (the Rainbow, Whirlpool and Lewiston-Queenston Bridges) located in Niagara County. In addition, the Peace Bridge provides convenient access to Highway 3, a major east-west Provincial Highway along the north shore of Lake Erie. Public transportation within Erie County is provided by the Niagara Frontier Transportation Authority (NFTA), which maintains an extensive bus network primarily serving the urbanized northwestern portion of the County. Regular routes are also provided to most of the 44 municipalities in Erie County. In addition, the NFTA operates a 6.4-mile light rail rapid transit line extending from Downtown Buffalo northwest along Main Street (NY 5) to the State University of New York at Buffalo's South Campus at the Amherst and Tonawanda borders. The NFTA also operates the Buffalo-Niagara International Airport in the Erie County Town of Cheektowaga, as well as Niagara Falls International Airport in Niagara County.

FEMA Disaster Declarations. Disaster declarations, for the county or counties affected by a disaster, are declared by the President of the United States under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the “Stafford Act”). FEMA then manages the entire process, including making federally-funded assistance available in declared areas; coordinates emergency rescue and response efforts; provides emergency resources; and provides other related activities/funding in the process of aiding citizens and local governments in a nationally-declared disaster. **Tables 1.3 and 1.4** provide a summary of disaster and emergency declarations for the State of New York (based on review of the FEMA and NYSOEM web sites and the New York State Hazard Mitigation Plan, and are current as of November 2014), with an indication as to whether Erie County was part of the declared area, and the type of assistance the County was eligible for: PA – Public Assistance, IA – Individual Assistance.

Since 1954, Erie County has been designated as eligible for at least one form of FEMA assistance in nine Federally-declared disasters and nine Federally-declared emergencies. Two of these disasters and one of the emergencies occurred after this plan was first adopted in 2005; both disaster declarations were for severe storms and flooding, and the emergency declaration was the result of an unusually severe snowstorm.

Year	Date	Disaster Type	Disaster Number	Was Erie County Designated?
2014	8-Jul	Severe Storms and Flooding	4180	No
2013	12-Jul	Severe Storms and Flooding	4129	No
2013	23-Apr	Severe Winter Storm and Snowstorm	4111	No
2012	30-Oct	Hurricane Sandy	4085	No
2011	13-Sep	Remnants of Tropical Storm Lee	4031	No
2011	31-Aug	Hurricane Irene	4020	No
2011	10-Jun	Severe Storms, Flooding, Tornadoes, and Straight-line Winds	1993	No
2011	18-Feb	Severe Winter Storm and Snowstorm	1957	No
2010	14-Oct	Severe Storms, Tornadoes, and Straight-line Winds	1943	No
2010	16-Apr	Severe Storms and Flooding	1899	No
2009	31-Dec	Severe Storms and Flooding Associated with Tropical Depression Ida and a Nor'easter	1869	No
2009	1-Sep	Severe Storms and Flooding	1857	Yes: IA, PA
2009	4-Mar	Severe Winter Storm	1827	No
2007	31-Aug	Severe Storms, Flooding, and Tornado	1724	No
2007	2-Jul	Severe Storms and Flooding	1710	No
2007	24-Apr	Severe Storms and Inland and Coastal Flooding	1692	No
2006	12-Dec	Severe Storms and Flooding	1670	No
2006	24-Oct	Severe Storms and Flooding	1665	Yes: IA, PA
2006	1-Jul	Severe Storms and Flooding	1650	No
2005	19-Apr	Severe Storms and Flooding	1589	No
2004	1-Oct	Tropical Depression Ivan	1565	No
2004	1-Oct	Severe Storms and Flooding	1564	No
2004	3-Aug	Severe Storms and Flooding	1534	Yes: PA
2003	29-Aug	Severe Storms, Tornadoes and Flooding	1486	No
2003	12-May	Ice Storm	1467	No
2002	16-May	Earthquake	1415	No
2002	1-Mar	Snowstorm	1404	Yes: PA
2001	11-Sep	World Trade Center Terrorist Attack	1391	Yes: PA
2000	21-Jul	Severe Storms	1335	No
1999	19-Sep	Hurricane Floyd	1296	No
1998	11-Sep	Severe Storms	1244	Yes: IA, PA
1998	7-Jul	Severe Storms and Flooding	1233	No

Table 1.3
New York State Major Disaster Declarations

Year	Date	Disaster Type	Disaster Number	Was Erie County Designated?
1998	16-Jun	New York Severe Thunderstorms and Tornadoes	1222	No
1998	10-Jan	Ice Storm	1196	No
1996	9-Dec	Severe Storms/Flooding	1148	No
1996	19-Nov	Severe Storms/Flooding	1146	No
1996	24-Jan	Severe Storms/Flooding	1095	No
1996	12-Jan	Blizzard	1083	No
1993	2-Apr	World Trade Center Explosion	984	No
1992	21-Dec	Coastal Storm, High Tides, Heavy Rain, Flooding	974	No
1991	16-Sep	Hurricane Bob	918	No
1991	21-Mar	Severe Storm, Winter Storm	898	No
1987	10-Nov	Severe Winter Storms	801	No
1987	15-May	Flooding	792	Yes: PA
1985	18-Oct	Hurricane Gloria	750	No
1985	22-Mar	Snow Melt, Ice Jams	734	No
1985	20-Mar	Flooding	733	No
1984	25-Sep	Severe Storms/Flooding	725	Yes: IA, PA
1984	17-Apr	Coastal Storms/Flooding	702	No
1977	5-Feb	Snowstorms	527	No
1976	3-Sep	Hurricane Belle	520	No
1976	21-Jul	Severe Storms/Flooding	515	Yes: IA, PA
1976	29-Jun	Flash Flooding	512	No
1976	19-Mar	Ice Storm, Severe Storms, Flooding	494	No
1975	2-Oct	Hurricane Eloise	487	No
1974	23-Jul	Severe Storms/Flooding	447	No
1973	20-Jul	Severe Storms/Flooding	401	No
1973	21-Mar	High Winds, Wave Action and Flooding	367	No
1972	23-Jun	Tropical Storm Agnes	338	No
1971	13-Sep	Severe Storms/Flooding	311	No
1970	22-Jul	Heavy Rains, Flooding	290	No
1969	26-Aug	Heavy Rains, Flooding	275	No
1967	30-Oct	Severe Storms/Flooding	233	No
1965	18-Aug	Water Shortage	204	No
1963	23-Aug	Heavy Rains, Flooding	158	No
1962	16-Mar	Severe Storm, High Tides, Flooding	129	No
1956	29-Mar	Flood	52	No
1955	22-Aug	Hurricanes Connie and Diane	45	No
1954	7-Oct	Hurricanes Carol and Hazel	26	No

Table 1.4
New York State Emergency Declarations

Year	Date	Emergency Type	Declaration Number	Was Erie County Designated?
2012	28-Oct	Hurricane Sandy	3351	Yes: PA
2011	8-Sep	Remnants of Tropical Storm Lee	3341	No
2011	26-Aug	Hurricane Irene	3328	No
2008	18-Dec	Severe Winter Storm	3299	No
2007	23-Feb	Snow	3273	No
2006	15-Oct	Snowstorm	3268	Yes: PA
2005	30-Sep	Hurricane Katrina Evacuation	3262	Yes: PA
2004	3-Mar	Snow	3195	No
2003	23-Aug	Power Outage	3186	Yes: PA
2003	27-Mar	Snowstorm	3184	No
2003	26-Feb	Snowstorm	3173	No
2002	1-Jan	Snowstorm	3170	Yes: PA

Table 1.4
New York State Emergency Declarations

Year	Date	Emergency Type	Declaration Number	Was Erie County Designated?
2000	4-Dec	Snow Storm	3157	Yes: PA
2000	11-Oct	Virus Threat	3155	Yes: PA
1999	18-Sep	Hurricane Floyd	3149	No
1999	10-Mar	Winter Storm	3138	No
1999	15-Jan	Snow Emergency	3136	Yes: PA
1993	17-Mar	Severe Blizzard	3107	Yes: PA
1980	21-May	Chemical Waste, Love Canal	3080	Yes: IA, PA
1978	7-Aug	Chemical Waste, Love Canal	3066	No
1977	29-Jan	Snowstorms	3027	No
1974	2-Nov	Flooding (NYS Barge Canal)	3004	No

Plan Development Process

Multi-Jurisdictional Approach

Erie County took a multi-jurisdictional approach to preparing its hazard mitigation plan. The County had resources (i.e., funding, data, GIS, etc.) which local jurisdictions lacked. However, the County could not develop the plan on its own. To undertake such a regional planning effort, the County needed to involve its member municipalities since only they have the legal authority to enforce compliance with land use planning and development issues. Throughout the plan development process, the Erie County Department of Emergency Services (ECDES) worked tirelessly to involve all of its 44 municipalities. These local jurisdictions were not only invited to participate but were truly guided through the process by ECDES and the project consultant at every stage.

All of the County's municipalities participated in, and were covered by, the earlier 2005 version of the plan. The following municipal entities (Erie County and 42 of its constituent municipalities) participated successfully in the update of this plan by attending meetings and submitting the key deliverables:

Erie, County of

Akron, Village of
Alden, Town of
Alden, Village of
Amherst, Town of
Angola, Village of
Aurora, Town of
Blasdell, Village of
Boston, Town of
Brant, Town of
Buffalo, City of
Cheektowaga, Town of
Clarence, Town of
Colden, Town of
Collins, Town of

Concord, Town of
Depew, Village of
East Aurora, Village of
Eden, Town of
Elma, Town of
Evans, Town of
Gowanda, Village of
Grand Island, Town of
Hamburg, Town of
Hamburg, Village of
Holland, Town of
Kenmore, Village of
Lackawanna, City of
Lancaster, Town of

Lancaster, Village of
Marilla, Town of
Newstead, Town of
North Collins, Town of
North Collins, Village of
Orchard Park, Town of
Orchard Park, Village of
Sardinia, Town of
Sloan, Village of
Springville, Village of
Tonawanda, City of
Tonawanda, Town of
West Seneca, Town of
Williamsville, Village of

The Village of Farnham and the Town of Wales opted not to participate in the plan update.

A more detailed summary of the participation demonstrated by each municipality in the County, including attendance at meetings and submission of requested deliverables, is presented in **Table 1.5**.

In addition, the records show that the following stakeholder entities participated by attending at least one meeting and/or by returning a signed Statement of Authority to Participate and keeping themselves apprised of the process through coordination with ECDES and regular review of information posted on the ECDES web site's hazard mitigation planning page.

American Red Cross
Erie County Department of Public Works
Erie County Department of Social Services
Erie County Disaster Preparedness Advisory Board
Erie County Local Emergency Planning Committee
National Grid
National Weather Service, Buffalo
New York State Department of Transportation
Niagara Frontier Transportation Authority
US Army Corps of Engineers, Buffalo District

URS Corporation (Clifton, NJ) acted as the plan development consultant providing hazard mitigation planning services and ultimately authoring this document.

Readers are invited to review the contents of ***Appendix G – Planning Committee Membership Information*** for a list of representatives from each participating jurisdiction.

Table 1.5
Erie County Jurisdictions Plan Participation

Jurisdiction	Returned Statement of Authority to Participate ⁵	Meetings Attended ⁶				Key Deliverables Submitted					
		Initiation Meeting 06/20/11 ⁷	CPG Kickoff Meeting 08/24/11	CPG Working Session 10/19/11	Meetings to Present the Draft Plan ⁸ 7/24/12, 9/25/12, 11/26/13, & 1/28/14	Land Use and Development Trends Worksheet	Outreach Log	Capabilities Assessment Worksheet	Mitigation Prioritization / Implementation Worksheets	Status of Past Projects and Plan Maintenance Activities Worksheets	NFIP Compliance Actions Worksheets
Erie, County of	N/A	■	■	■	■	■	■	■	■	■	N/A
Akron, Village of	■	N/A	■	■	ANR	■	■	■	■	■	■
Alden, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Alden, Village of	■	N/A	■	■	ANR	■	■	■	■	■	■
Amherst, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Angola, Village of	■	N/A	■	■	ANR	■	■	■	■	■	■
Aurora, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Blasdell, Village of	■	N/A	■		ANR	■	■	■	■	■	■
Boston, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Brant, Town of	□	N/A			ANR	■	■	■	■	■	■
Buffalo, City of	□	N/A			ANR	■	■	■	■	■	■
Cheektowaga, Town of	■	N/A	■		ANR	■	■	■	■	■	■
Clarence, Town of	■	N/A			ANR	■	■	■	■	■	■
Colden, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Collins, Town of	■	N/A	■		ANR	■	■	■	■	■	■
Concord, Town of	■	N/A			ANR	■	■	■	■	■	■
Depew, Village of	■	N/A	■	■	ANR	■	■	■	■	■	■
East Aurora, Village of	■	N/A		■	ANR	■	■	■	■	■	■
Eden, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Elma, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Evans, Town of	■	N/A	■		ANR	■	■	■	■	■	■
<i>Farnham, Village of</i>	■	N/A									
Gowanda, Village of	■	N/A			ANR	■	■	■	■	■	■

⁵ Farnham and Wales initially opted in by returning a Statement of Authority to Participate in 2011, but then did not follow through by directly participating in the process and did not meet participation requirements. Brant and Buffalo didn't return a formal Statement to Participate or to Decline (shown as "□", above), but they did designate representatives for the CPG and met all participation requirements and therefore, the County deemed that this was acceptable, even though their actual paper Statements were not received.

⁶ Some CPG members were unable to attend the CPG's meetings due to conflicts with their regular job duties. The County determined that this was acceptable to them, as long as all other participation requirements were met by the community.

⁷ The Project Initiation Meeting for the first plan update process was a working coordination and planning meeting between ECDES and URS conducted at the outset of the plan update in the summer of 2011, while CPG membership was under development. Jurisdictions and stakeholders were not invited to attend, and are shown as "N/A" in the table above ("not applicable").

⁸ The Draft Plan was discussed at meetings of the Disaster Preparedness Advisory Board (DPAB) on July 24, 2012; September 25, 2012; November 26, 2013; and January 28, 2014. These meetings were held as joint DPAB / Disaster Coordinators meetings with the County and Municipalities. Most Disaster Coordinators are also CPG members. "ANR" = Attendees Not Recorded (the County did not retain its sign in sheets for these meetings). ECDES included a status update and solicited feedback, and offered assistance as part of their County reports at each meeting. DPAB meetings are open to – but rarely attended by – members of the public. The DPAB is a volunteer board. One third of the members are active members of voluntary fire companies and the remainder are elected officials or their representatives, representatives of organizations involved in civil defense and disaster preparedness and other citizens of the county.

Table 1.5
Erie County Jurisdictions Plan Participation

Jurisdiction	Returned Statement of Authority to Participate ⁵	Meetings Attended ⁶				Key Deliverables Submitted					
		Initiation Meeting 06/20/11 ⁷	CPG Kickoff Meeting 08/24/11	CPG Working Session 10/19/11	Meetings to Present the Draft Plan ⁸ 7/24/12, 9/25/12, 11/26/13, & 1/28/14	Land Use and Development Trends Worksheet	Outreach Log	Capabilities Assessment Worksheet	Mitigation Prioritization / Implementation Worksheets	Status of Past Projects and Plan Maintenance Activities Worksheets	NFIP Compliance Actions Worksheets
Grand Island, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Hamburg, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Hamburg, Village of	■	N/A	■	■	ANR	■	■	■	■	■	■
Holland, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Kenmore, Village of	■	N/A			ANR	■	■	■	■	■	■
Lackawanna, City of	■	N/A	■		ANR	■	■	■	■	■	■
Lancaster, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Lancaster, Village of	■	N/A		■	ANR	■	■	■	■	■	■
Marilla, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Newstead, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
North Collins, Town of	■	N/A			ANR	■	■	■	■	■	■
North Collins, Village of	■	N/A			ANR	■	■	■	■	■	■
Orchard Park, Town of	■	N/A		■	ANR	■	■	■	■	■	■
Orchard Park, Village of	■	N/A			ANR	■	■	■	■	■	■
Sardinia, Town of	■	N/A	■	■	ANR	■	■	■	■	■	■
Sloan, Village of	■	N/A			ANR	■	■	■	■	■	■
Springville, Village of	■	N/A			ANR	■	■	■	■	■	■
Tonawanda, City of	■	N/A	■	■	ANR	■	■	■	■	■	■
Tonawanda, Town of	■	N/A			ANR	■	■	■	■	■	■
<i>Wales, Town of</i>	■	N/A									
West Seneca, Town of	■	N/A			ANR	■	■	■	■	■	■
Williamsville, Village of	■	N/A	■	■	ANR	■	■	■	■	■	■
Stakeholders:											
American Red Cross		N/A	■		ANR						
Cattaraugus County Emergency Manager		N/A			ANR						
Chautauqua County Emergency Manager		N/A			ANR						
Genesee County Emergency Manager		N/A			ANR						
Erie County Commissioner of Environment and Planning		N/A	■	■	ANR						
Erie County Commissioner of Highways		N/A			ANR						
Erie County Commissioner of Social Services	■	N/A	■		ANR						

Table 1.5
Erie County Jurisdictions Plan Participation

Jurisdiction	Returned Statement of Authority to Participate ⁵	Meetings Attended ⁶				Key Deliverables Submitted					
		Initiation Meeting 06/20/11 ⁷	CPG Kickoff Meeting 08/24/11	CPG Working Session 10/19/11	Meetings to Present the Draft Plan ⁸ 7/24/12, 9/25/12, 11/26/13, & 1/28/14	Land Use and Development Trends Worksheet	Outreach Log	Capabilities Assessment Worksheet	Mitigation Prioritization / Implementation Worksheets	Status of Past Projects and Plan Maintenance Activities Worksheets	NFIP Compliance Actions Worksheets
Erie County Department of Health, Bioterrorism Program		N/A			ANR						
Erie County Department of Public Works				■	ANR						
Erie County Disaster Preparedness Advisory Board, Chair		N/A		■	ANR						
Erie County Department of Information and Support Services		N/A			ANR						
Erie County Local Emergency Planning Committee, Chairman	■	N/A	■	■	ANR						
Erie County Medical Center, Regional Emergency Preparedness Coordinator		N/A			ANR						
Erie County Sheriff's Department		N/A			ANR						
Erie County Soil and Water Conservation District		N/A			ANR						
Erie County Water Authority		N/A			ANR						
National Fuel Gas		N/A			ANR						
National Grid		N/A	■		ANR						
National Weather Service Buffalo		N/A	■		ANR						
New York State Department of Transportation		N/A	■		ANR						
New York State Electric and Gas		N/A			ANR						
Niagara County Emergency Manager		N/A			ANR						
Niagara Frontier Transportation Authority	■	N/A	■		ANR						
US Army Corps of Engineers, Buffalo District		N/A	■		ANR						
Wyoming County Emergency Manager		N/A			ANR						
Consultant:											
URS	N/A	■	■	■							

While the County retained the services of a consultant (URS Corporation) to guide participants through the process and author the plan, participating jurisdictions contributed throughout the overall planning process, as follows⁹:

- Each participating jurisdiction provided staff to participate in the overall county-wide Core Planning Group (CPG). Each municipality was encouraged to form a Jurisdictional Assessment Team, to be responsible for reviewing information, data and documents, submitting feedback to the Consultant, completing questionnaires/forms, reaching out to the public and other stakeholders in their respective jurisdictions, developing a unique mitigation strategy for their municipality, and reviewing and commenting on draft documents. The jurisdiction's CPG member(s) were lead member(s) of their municipality's Jurisdictional Assessment Team (JAT). More information on the planning team structure and roles/responsibilities is presented later in this section.
- The Consultant provided ***“Guidance Memorandum 1- Assessing Community Support, Building the Planning Team, and Engaging the Public and Other Stakeholders”*** at the project outset (July 12, 2011). This memorandum was later distributed to all CPG members at the Kickoff Meeting of August 24, 2011 and various points thereafter (via email and/or subsequent meeting handouts). This memorandum was prepared to provide Erie County and its participating jurisdictions with suggestions for: assessing community support, building the planning team and engaging the public and other stakeholders throughout the plan development process and prior to plan approval. The Jurisdictional Assessment Team for each municipality used this memorandum as a guide for outreach, documented their completed activities in the memorandum's **“Outreach Log”**. The County and 42 jurisdictions provided a summary of their outreach activities to the Consultant for incorporation into the plan.
- Participating jurisdictions provided feedback during the evaluation of Land Uses and Development Trends step of the process (Section 3.d of the plan) through their completion and submittal of a **Land Uses and Development Trends Questionnaire** to the Consultant. This questionnaire asked jurisdictions to: (1) describe development trends occurring within their jurisdiction, such as the predominant types of development occurring, location, expected intensity, and pace by land use; and (2) describe any regulations/ordinances/codes their jurisdiction enforces to protect new development from the effects of natural hazards. Local responses were used by the Consultant to supplement information presented in the Erie-Niagara Framework for Regional Growth. The County and 42 jurisdictions returned this questionnaire.
- Participating jurisdictions provided feedback during the Capability Assessment step of the process (Section 4 of the plan) through their completion and submittal of a **Capability Assessment Questionnaire** to the Consultant. This questionnaire asked respondents to examine their jurisdiction's abilities to implement and manage a comprehensive mitigation strategy, which includes a range of mitigation actions. The questionnaires requested information pertaining to existing plans, policies, and regulations that contribute to or hinder the ability to implement hazard mitigation actions. They also requested information pertaining to the legal and regulatory capability, technical and administrative capacity, and fiscal capability of each jurisdiction. The County and 42 jurisdictions submitted completed questionnaires illustrating their capability to implement a mitigation strategy.
- Participating jurisdictions provided feedback on the **status of their respective mitigation strategies, as identified in the 2005 plan**, as part of a worksheet entitled “Status of Past Projects and Plan Maintenance Activities Worksheet”. The County and 42 jurisdictions returned this worksheet. Copies of jurisdictional responses are included in **Appendix N**.

⁹ Electronic copies of all questionnaire/worksheet responses are maintained at ECDES. Copies of Prioritization, Implementation, and NFIP worksheets submitted by the participating jurisdictions are included in Appendices D, E, and F, respectively. Appendix N includes documentation regarding the status of past projects and plan maintenance activities.

- Participating jurisdictions have each considered **problem areas in their respective jurisdictions in need of mitigation and possible mitigation alternatives**. The County and 42 of its participating jurisdictions have developed a unique mitigation strategy. The prioritization of action items is documented in worksheets included in **Appendix D**; while implementation strategies are documented in worksheets included in **Appendix E**.
- Participating jurisdictions provided feedback on the **status of the first cycle's plan maintenance and integration activities**, as well as their preferences for plan maintenance activities to be conducted in future planning cycles, as part of a worksheet entitled "Status of Past Projects and Plan Maintenance Activities from the 2005 Plan". The County and 42 jurisdictions returned this worksheet. ECDES and the consultant worked to develop a county-wide plan maintenance and plan integration strategy that would best suit the County and its jurisdictions while meeting the minimum requirements of DMA 2000 and its implementing regulations. Copies of jurisdictional responses are included in **Appendix N**.
- Participating jurisdictions also provided feedback regarding their participation in the National Flood Insurance Program, and their strategy for continued compliance with its requirements, as part of the "**NFIP Compliance Actions Worksheet**". A total of 42 participating jurisdictions returned this worksheet. Copies of their responses are included in **Appendix F**.

Erie County Hazard Mitigation Planning Committee

This Plan has been developed by the **Erie County Hazard Mitigation Planning Committee (the "Planning Committee")**, with support from an outside consulting firm (URS Corporation, "URS"). The efforts of the Planning Committee were headed by Jerry Whittington, Deputy Commissioner of the ECDES with assistance from James Glass, also of ECDES. The Plan represents the collective efforts of citizens, elected and appointed government officials, business leaders, volunteers of non-profit organizations, and other stakeholders.

The overall **Planning Committee** consisted of members of Erie County, each participating jurisdiction, and the public and other stakeholders. The overall Planning Committee did not meet together in one place during the planning process. Instead, a team concept was used to more evenly distribute responsibilities and to make best use of every participant's unique capabilities.

As shown in **Figure 1.4**, the overall Planning Committee was divided into a **Core Planning Group (CPG)** and a series of **Jurisdictional Assessment Teams (JATs)**, with one JAT for each of the County's participating jurisdictions. Each jurisdiction was encouraged to form a JAT by bringing together personnel from their local government organization, ideally utilizing people with knowledge and experience of local administration, planning, hazards, and infrastructure. While in practice each individual JAT varied in number and composition, each participating municipality provided at least one person who was actively involved throughout the planning process. The names of all JAT members whose participation was documented by attendance at meetings or completion of the various deliverables are included in **Appendix G**.

The Role of the County in the Plan Update Process

The role of the County in the plan development process was to act as lead agency and facilitator on behalf of the participating jurisdictions. The County was originally responsible for securing the grant funding for the plan and for originally soliciting the participation of all jurisdictions. The County was responsible for selecting the consultant, administering the contract, and ensuring payment to the consultant.

As well as acting as a jurisdiction in its own right, the County took on the responsibility of managing all communications between the consultant and the CPG (principally through the use of a master email

mailing list), distributing all drafts to jurisdictions and reviewing agencies, distributing deliverables and outreach materials, and facilitating meetings. For each meeting the County was responsible for procuring the venue and presentation equipment, distributing invitations, and disseminating any subsequent relevant information. The County also hosted the central hazard mitigation planning website, including the interactive mitigation survey, the results of which the County was also responsible for processing and forwarding to the consultant. The ECDES was the County agency tasked with meeting the County's responsibilities, and the plan coordinator and main point of contact was Mr. Jerry Whittington (see the Executive Summary, Page iii).

This team concept was beneficial for two reasons: (1) the Consultant and the County's main points of contact was the Erie County Planning Committee and the CPG; and (2) JATs with intimate local knowledge were best suited for coordination and outreach within their respective jurisdictions.

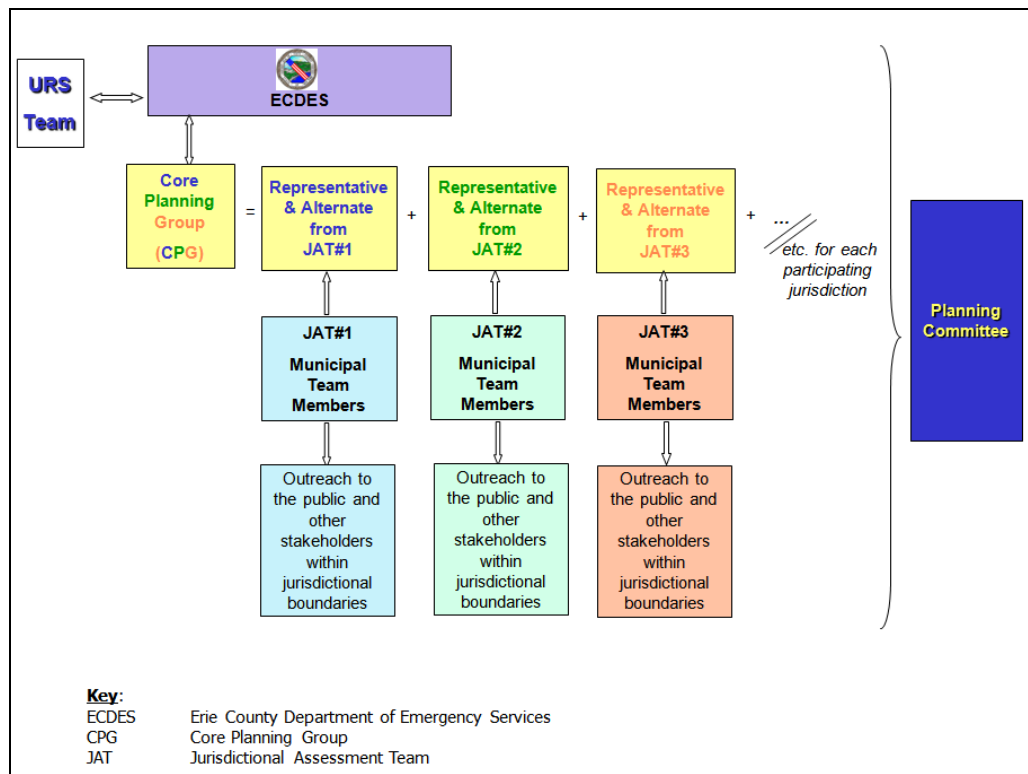
ECDES Efforts to Involve All of the County's Municipalities in the Plan Update

On August 2, 2011, ECDES sent formal correspondence to each jurisdiction in the county inviting them participate in the multi-jurisdictional hazard mitigation plan update process. The letter explained the process, invited local participation in the multi-jurisdictional plan, and outlined some advantages to having a plan in place and participating in a larger multi-jurisdictional plan. Each municipality was asked to sign and return one of two formal statements of authority – one indicating a desire to participate and the second indicating a desire to decline. Municipalities were advised that if opting to participate, they should identify a single representative and an alternate to represent their jurisdiction on the Core Planning Group and fill this information in on the appropriate line of an attached Statement of Authority to Participate or decline from the process. In this same letter, municipalities were also invited to attend a plan update Kickoff Meeting on August 24, 2011, at 6 pm at the Erie County Fire Training and Operations Center, 3359 Broadway, Cheektowaga.

Municipal participation subsequent to the August 2nd invitation letter and the August 24th Kickoff Meeting was substantial, but not 100 percent. Recognizing the importance of expanding and enhancing local jurisdiction participation with an aim toward participation by all of the county's municipalities, ECDES contacted each municipality not represented at the Kickoff Meeting via email on September 1st, and sent out a subsequent letter, again inviting participation and providing a copy of all presentation materials and handouts from the Kickoff Meeting. Regular telephone coordination also occurred between ECDES and the municipalities.

Outreach to the municipalities was conducted on an ongoing basis thereafter. Regular telephone calls were made between the County and/or consultant and CPG members to offer assistance, support, reminders regarding meetings and upcoming deliverables, etc. ECDES also sent out periodic emails to every jurisdiction in the county (regardless of stated desire to participate) regarding the project, status, current level of municipal participation and ongoing invitation to join in the process, upcoming meetings and or current deliverables due for completion by CPG members and subsequent delivery to consultant, and next steps in going forward. These email messages were distributed on the following occasions during the plan development process: August 2, 2011; September 23, 2011; September 26, 2011; October 4, 2011; October 25, 2011; November 17, 2011; November 30, 2011; December 12, 2011; and December 13, 2011.

As a result of all of these efforts of the ECDES, 42 of the County's 44 municipalities ultimately participated successfully by attending meetings, providing feedback, selecting action items, etc.

Figure 1.4 – Planning Committee Organizational Structure

All members of the CPG and the JATs were also members of the overall Planning Committee. The CPG included head members of each JAT (the County and each of the municipalities who elected to participate in the process). The Erie County Planning Committee was responsible for managing the overall plan formulation activities. The CPG was responsible for attending CPG meetings and providing information and feedback, and coordinating an outreach program within their municipality's JAT and beyond to the public and other stakeholders. Each JAT was responsible for coordinating and facilitating local efforts, sending CPG representatives to meetings, providing information and feedback, involving the public and local community stakeholders in the planning process, assessing mitigation alternatives, selecting a course of action to be followed for their community, adopting the plan, and participating in plan monitoring and implementation.

With regard to meetings, ECDES was responsible for setting meeting dates and times, securing a meeting facility, and notifying all team members of upcoming meetings. They also played a very large role in reminding CPG members of certain project deadlines. The Consultant prepared meeting agendas, handouts, PowerPoint presentations, and applicable worksheets. ECDES maintained the County's web site posting various informational materials and plan documents.

The plan update process was initiated in earnest in the summer of 2011 with the Erie County Hazard Mitigation Plan Update Project Initiation Meeting held on June 20, 2011. At this meeting, the consultant met with the ECDES to refine the project work plan, discuss schedule and the anticipated level of County labor support. The Consultant also discussed regarding assessing community support, building the planning team, and engaging the public. At this meeting, expectations regarding the CPG Plan Update Kickoff Meeting were discussed. Handouts included an agenda, the project scope of work, and targeted implementation schedule.

While JATs met individually throughout the plan update process as they deemed necessary, the following is an overview of CPG meetings held during the plan update process.

- August 24, 2011 – Core Planning Group Kickoff Meeting. This was the first meeting of the Core Planning Group. Thirty-six individuals were in attendance, representing twenty-one jurisdictions and nine stakeholder groups. Over the course of this meeting, participants were provided with an overview of: the intent of the project; the organizational structure of the planning group; the plan update process overall; the role of participating jurisdictions, contractors, the public and other stakeholders; what it means to participate successfully in the update; key deliverables; data collection/supporting documents; the project timeline; and next steps. Handouts included an agenda, the PowerPoint presentation, plan update project Fact Sheet, and Guidance Memo #1 – Outreach to the Public and Other Stakeholders. ECDES reiterated the benefits of continued municipal participation and the requirements that must be met for a municipality to be considered fully participating.
- October 19, 2011 – Core Planning Group Working Session. At this working session, attendees were provided with one-on-one assistance in completing the plan update worksheets (Land Use and Development Trends Worksheets, Capability Assessment, Outreach Log, Status of Past Projects and Plan Maintenance Activities, Prioritization Worksheet, Implementation Strategy Worksheet, and NFIP Compliance Actions Worksheet) – with a special focus on the mitigation strategy requirements and worksheets, including how to conduct an evaluation and prioritization of hazard mitigation actions for locally-significant hazards, and how to develop an implementation strategy for selected mitigation actions. The County and 24 municipal jurisdictions attended this working session, which was conducted between the hours of 9:00 am and 4:30 pm, and then again from 6:00 pm to 8:00 pm, at the Fire Training Center. In the months that followed, one-on-one assistance was provided remotely by the consultant over the phone and via email. ECDES also conducted one-on-one meetings with a subset of municipalities in need of additional assistance, with an aim toward achieving participation from 100 percent of the county’s 44 municipalities in the plan update. In all, the County and 42 municipalities have now evaluated risks, prioritized projects, and developed an implementation strategy for their locally-selected actions.
- Meetings to Present the Draft Plan. The Draft Plan was completed and emailed to CPG members for review in April 2012. Participating communities convened at meetings of the DPAB on July 24, 2012; September 25, 2012; November 26, 2013; and January 28, 2014 to discuss the Draft Plan and its status in the NYSOEM and FEMA review cycles, as well as future actions to be taken after the plan is approved in terms of local adoption. On receiving FEMA’s “approvable pending adoption” designation, each local jurisdiction will present the Final Plan to the public and other stakeholders in an open public session of their local governing body.

See **Appendix H** for agendas, attendance sheets, and copies of presentations made at the CPG meetings listed above.¹⁰

The Role of the Contractors in the Plan Update Process

This Hazard Mitigation Plan Update is the County’s plan; as such, its success rests on the decisions and directions set by the Planning Committee members throughout the plan development process. URS was contracted by Erie County to work with the ECDES and the Planning Committee to assist them in developing a plan update that would meet the requirements of DMA 2000. URS Corporation (URS) was the lead firm for this assignment, doing so from their local office in Wayne, New Jersey. URS was the direct County point of contact and assisted in all aspects of the plan update, guided local municipalities

¹⁰ ECDES was unable to locate sign in sheets or meeting materials for meetings of the DPAB.

through their participation in key aspects of the update in a manner that would meet current requirements, lead the hazard mitigation planning efforts, authored the final document, and provided overall contract administration.

URS assisted the Planning Committee by conducting the analyses necessary to provide the team members with the information they needed to make sound decisions, and helped guide them through the necessary steps of the plan update process. The Planning Committee, in turn, took the lead by including the local community, assessing the alternatives, and ultimately selecting the course of action to be followed. At the end of the planning process, URS prepared this updated plan text (with feedback from the Planning Committee) to document the group's efforts, along with hazard information and findings, in a manner consistent with applicable regulations (DMA 2000), criteria (44 CFR Part 201.6), and guidance (FEMA's Mitigation Planning "How-To" Guides; FEMA's Multi-Hazard Mitigation Planning Guidance document of March 2004 (Revised July 2008)).

A guidance memorandum was distributed to the CPG by URS Corporation via ECDES over email, at the plan update kickoff meeting, and also posted on the County's mitigation planning web site). *Guidance Memorandum #1 – Outreach to the Public and Other Stakeholders*, dated July 12, 2011, provided a summary of key information presented in DMA 2000, its implementing regulations (IFR), and the FEMA How-To Guides regarding the key topic area of reaching out to the public and other stakeholders. The memo was intended to serve as a supplement – and not as a replacement – to the FEMA documents. It provided suggestions to municipalities for how to meet minimum requirements during the plan update, and requested feedback from each municipality at the end of the process regarding their activities.

In addition, URS also: (1) distributed worksheets for CPG member completion, as described previously beginning on Page 1-15, and provided one-on-one assistance in their completion via a working session and email and telephone support; (2) assisted the CPG through preparation of a project Fact Sheet (discussed on Page 1-24) and development of a project web site (discussed beginning on Page 1-21); and (3) presented at each meeting to guide the County participating jurisdictions through this first plan update.

Opportunities for Public Involvement in the Plan Update Process

The role of public involvement in the plan update process is to provide the general public with some variety of means to not only learn about the process that the Planning Committee is undertaking, but to become involved, voice concerns and to provide input throughout the planning process. CPG members undertook a range of activities to: (a) alert the public to the fact that the Planning Committee was working to update this Hazard Mitigation Plan, and (b) provide the public an opportunity to participate with a forum to ask questions, and submit comments and/or suggestions on any aspect of the process.

The Planning Committee pursued a variety of different ways to provide the public with an opportunity to become involved and engaged during the planning process. As such, the following key activities were employed:

- Erie County Multi-jurisdictional Mitigation Planning web site
- *Plan Facts* project fact sheet
- Open public meetings
- Press
- Other outreach activities by County and municipal CPG members

Every municipality participating in the plan update contributed to the team's overall outreach efforts.

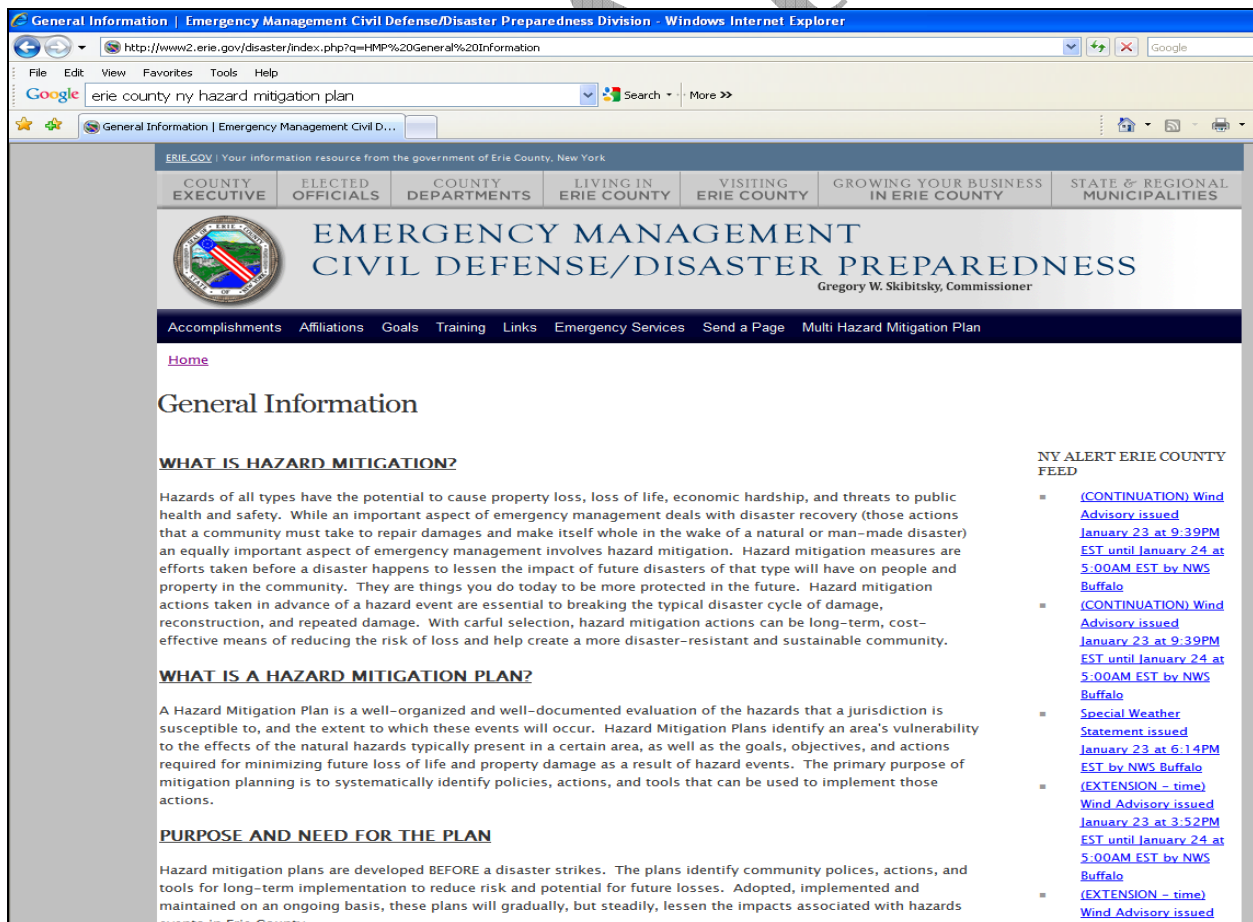
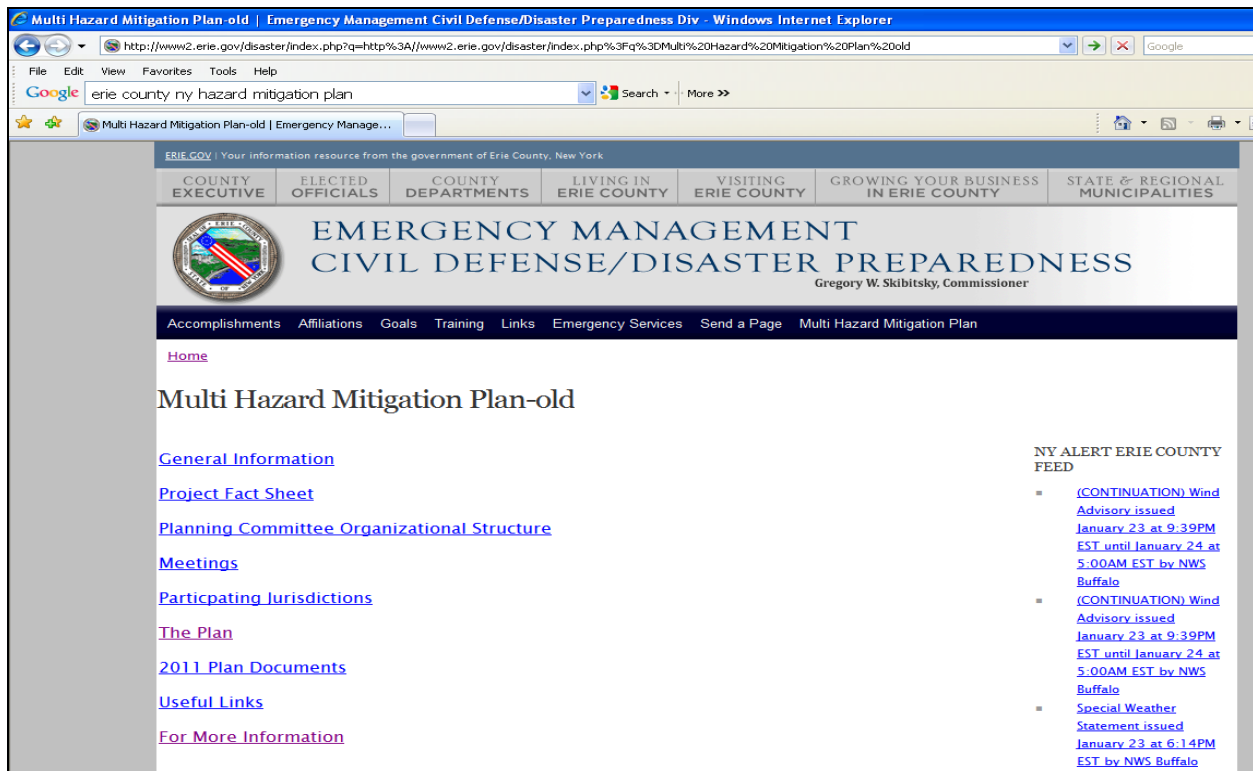
Erie County Multi-Jurisdictional Hazard Mitigation Planning Web Site

The CPG made an effort to involve the public and other stakeholders in the process during the update of this plan in part through a mitigation planning web site¹¹. The Erie County web site contains a new section on the county-wide multi-jurisdictional hazard mitigation plan update process. It can be found online at: <http://www2.erie.gov/disaster/> and then clicking on “Multi Hazard Mitigation Plan.”

The web site was initiated by ECDES in the summer of 2011 and will continue to be maintained and updated by ECDES on a regular basis. The additional web pages were incorporated into the site for the purpose of providing information about the importance of hazard mitigation planning and to solicit participation and feedback during the plan update. In this section, the ECDES provides general information about the process, the organizational structure of the planning team, meeting information (agendas, presentations, handouts), other reference materials, a link for the Draft Plan, and more. Contact information for the ECDES Commissioner, Deputy Commissioner, and Emergency Services Coordinator is also provided and individuals are invited to reach out to the Deputy Commissioner, in particular, for information on how to become involved or to provide feedback. The image below is a screen-capture of the main mitigation planning web page on the County’s site. Many municipal jurisdictions also included links on their web sites to this overall project page (screen captures of municipal links can be found in **Appendix I**).



¹¹ The public was made aware of the web site the following ways: (a) it appears in a Google search for the plan update; (b) it appears when one uses the Erie County web site search engine; (c) via outreach activities shown in Table 1.6; (d) the fact sheet was widely distributed, and has an “our website” section with a link. The fact sheet was posted in hard copy in various locations throughout the county (locations as per Table 1.6). Also, Page 1-25 section entitled “press” refers reader to Appendix I for things appearing in local papers, and it is noted that many of these news articles refer to the web site. Paragraph 5 references Table 1.6 and Appendix I.



The main page of the website, as illustrated above, presents an introduction to hazard mitigation planning, outlining the purpose and need for the plan, municipal participation and Core Planning Group structure, the basic steps in the process, and key dates in the schedule. A series of links in the center of the main page provides access to the following additional information:

- General Information: Definitions of hazard mitigation, explanations of the purpose and need for the plan, participation requirements, planning group structure, and the overall schedule.
- Project fact sheet: *Plan Facts* (see below) in PDF format for downloading.
- Planning Committee Organizational Structure: The roles of the County, municipalities, other stakeholders, and the consultant.
- Meetings: Overview of CPG meetings.
- Participating Jurisdictions: Listing of municipalities participating in the project.
- The Plan: PDF copies of the Plan for downloading.
- 2011 Plan Documents: Blank copies of worksheets that each municipality completed
- Useful Links: Links to the NY State Emergency Management Office and to various FEMA web pages giving information on mitigation planning, grants, and disasters.
- For More Information: Full contact details for ECDES.


PlanFacts

The CPG made an effort to involve the public and other stakeholders in the process during the drafting stage of this plan update in part through a project fact sheet. The Planning Committee increased public awareness of the hazard mitigation plan update by providing a two-page summation on hazard mitigation facts and the mitigation planning process to the public, community leaders, business owners, local residents and other stakeholders in the plan. The flyer, entitled *Erie County Multi-Jurisdictional Natural Hazard Mitigation Planning Update: PlanFacts*, furnishes pertinent plan data that explains the purpose and need for the mitigation plan in Erie County and its required update.

The two-page flyer begins by providing a basic understanding to “What is hazard mitigation?” It then contains information on the plan development and update process and how jurisdictions can participate in the update or prepare their own hazard mitigation plans in compliance with DMA 2000 requirements. It also provides an overview of the Hazard Mitigation Planning Committee members and their roles; the steps in the mitigation process (goals, objectives, natural hazards evaluation, etc.); the plan scheduled target completion date; and a point of contact at ECDES for more information.

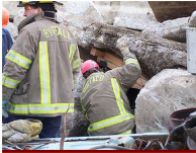
PlanFacts was distributed by ECDES to the attendees at the Core Planning Group Kickoff Meeting on August 24, 2011. It was also posted by several Core Planning Group Members on local notice boards throughout the county. The Fact Sheet can be found electronically (PDF format) at the Erie County Office of Emergency Management web site address given above.

PlanFacts was also distributed in hard copy format widely throughout the County by ECDES and other CPG members. Locations that it has been posted/distributed include local libraries, fire departments, and city/town/village halls. A copy of the full fact sheet is presented here:




Erie County Multi-Jurisdictional Hazard Mitigation Plan Update **PLAN FACTS**


JULY 18, 2011



WHAT IS HAZARD MITIGATION?
Natural hazards have the potential to cause property damage, loss of life, economic hardship, and threats to public health and safety.

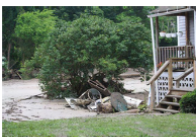
Hazard mitigation measures are the things you do today to be more protected in the future. They are measures taken before a disaster happens to reduce the impact that future disasters will have on people and property in the community. Mitigation reduces the risk of loss and creates a more disaster-resistant and sustainable community. Hazard mitigation measures are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage.






PURPOSE AND NEED FOR THE PLAN
Hazard mitigation plans are developed BEFORE a disaster strikes. The plans identify community policies, actions, and tools for long-term implementation to reduce risk and potential for future losses. Adopted, implemented and maintained on an ongoing basis, these plans will gradually, but steadily, lessen the impacts associated with hazard events.

As of November 1, 2004 communities without a FEMA-approved hazard mitigation plan are not eligible for FEMA mitigation project grant monies under programs such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMA) and Pre-Disaster Mitigation Grant Program (PDM).



PARTICIPATION
Jurisdictions who wish to be recognized by FEMA as being compliant with DMA 2000 must either: (a) participate in the multi-jurisdictional plan development process and formally adopt the final plan, or (b) prepare their own hazard mitigation plan. All jurisdictions in Erie County are being invited to participate in the multi-jurisdictional plan update process.

To be recognized in FEMA's eyes as successfully participating in the multi-jurisdictional plan, jurisdictions must: participate actively in the planning process; develop unique jurisdictional mitigation actions; and formally adopt the final plan. Active participation involves attending meetings, providing feedback, and reaching out to the public and other key stakeholders in the community.



STRUCTURE
Elected and appointed government officials, business leaders, volunteers of non-profit organizations, citizens, and other stakeholders who choose to participate will become part of our overall Erie County Multi-Jurisdictional Hazard Mitigation Planning Committee. To keep meeting sizes to workable numbers, the Planning Committee will be broken up

PLANFACTS

into a Core Planning Group (CPG) and Jurisdictional Assessment Teams (JATs).

The CPG will include representatives of Erie County and any of the county's jurisdictions who elect to participate in the update process. The CPG will manage the overall plan formulation activities and contribute to the decision making process. Representatives on the CPG will coordinate the plan efforts by organizing outreach by means of a team concept through the JATs.

The JATs will include representatives from the individual participating jurisdictions. They will be responsible for local community involvement in the multi-jurisdictional mitigation plan update.

Regardless of team, all participating jurisdictions must:

- Coordinate and facilitate local efforts.
- Attend meetings.
- Provide information and feedback.
- Involve the public and community stakeholders in the planning process.
- Assess mitigation alternatives.
- Select a course of action to be followed for their communities.
- Participate in plan implementation, monitoring and updates.

PROCESS
The mitigation plan update process will begin during June 2011. A Draft Plan is targeted for completion in December of 2011.

OUR WEBSITE
A Multi-Jurisdictional Hazard Mitigation Planning Page is currently under development on the Erie County Emergency Service's web site. We encourage you to check back for additional information and updates at: www.erie.gov/disaster

Thank you for your interest! For questions or other feedback, please contact:

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Open Public Meetings

The Erie County Multi-Jurisdictional Hazard Mitigation Plan Update was discussed at Meeting No. 14 of the Erie County Legislature on July 22, 2010.

The hazard mitigation plan update was included as an agenda item at seven Erie County Sewer District (ECSD) Board of Managers meetings, each of which was open to the public. They were: ECSD No. 8 on October 4, 2011; ECSD No. 1 on October 7, 2011; ECSD No. 6 on October 11, 2011; ECSD No. 3 and No. 4 on October 12, 2011; ECSD No. 2 on October 13, 2011; and ECSD No. 5 on October 19, 2011.

ECDES discussed the mitigation plan update process at two meetings of the Erie County Local Emergency Planning Committee (LEPC). The LEPC includes members of the general public as well as key stakeholders. These meetings were held on September 14, 2011 and November 9, 2011. The Erie County LEPC meets bi-monthly at the Erie County Fire Training Academy and its meetings are open to the public and an announcement is sent to the local newspaper for posting.

ECDES also discussed the plan update at a meeting of the Erie County Disaster Preparedness Advisory Board (DPAB) on September 27, 2011; July 24, 2012; September 25, 2012; November 26, 2012; and January 28, 2014. The DPAB is a volunteer board. One third of the members are active members of voluntary fire companies and the remainder are elected officials or their representatives, representatives of organizations involved in civil defense and disaster preparedness and other citizens of the county. Typically, the DPAB meetings are not attended by the public; however, anyone is welcome to attend. An announcement is usually not sent to the local newspaper for the DPAB meetings.

Several participating jurisdictions spoke about the mitigation plan update process at regularly scheduled meetings in their respective municipalities (i.e., board meetings), granting the public and other

stakeholders an opportunity to participate in the process. See **Table 1.6** and **Appendix I** for more information.

In addition, there will be open meetings of local governing bodies before resolutions are passed to formally adopt the plan (see individual resolutions for more information). Following completion of the plan update and FEMA's approval, the document will be presented at an open public meeting of the County Legislators prior to its formal adoption. In addition to Legislators and members of the public, who will be encouraged to review the plan and make comments, members of the local news media may be invited to attend.

Press

Information regarding the hazard mitigation planning project appeared in various news outlets over the course of the project. Specifically: *IsleGrande.com* – August 15, 2011; *The East Aurora Advertiser* – August 15, 2011; *The Sun* – September 14, 2011; *The Buffalo News* – October 5, 2011; *The Alden Advertiser* – October 20, 2011; *The Front Page* - October 26, 2011; *The West Seneca Bee* – October 27, 2011; *The Cheektowaga Bee* – November 3, 2011; and *The Lancaster Bee* – November 3, 2011. Copies of these articles can be found in **Appendix I**.

Other Outreach Activities by ECDES and CPG Members

In addition to the web site, fact sheet, and open public meetings held, the Core Planning Group (through their respective JATs) undertook the actions summarized in chronological order in **Table 1.6** to raise awareness of the plan development process among those not directly tasked with involvement in the plan process, and provide the public and other stakeholders with a forum for participating in - and providing feedback throughout - the plan development process. While participating jurisdictions have provided comments, to date, no feedback from the public or other stakeholders has been received. Comments received in time to be incorporated into the Final will be reviewed by the Consultant and ECDES and integrated into the plan as applicable. As this is a living document, other comments will be considered for integration during future maintenance cycles and plan updates. Since there was limited response to the initial outreach efforts, CPG members will consider more targeted outreach to the public and other stakeholders during the plan maintenance phase to elicit feedback. This could include activities such as: (1) increased use of social media; (2) extensive outreach to local media outlets (television, radio, and print media partners) to prepare stories to help promote widespread public involvement and awareness, and to elicit feedback and comments; (3) formal presentations to governing bodies regarding the hazard mitigation plan (in an open public forum setting); (4) and targeted public/stakeholder events such as roundtables and public forums specifically regarding the plan, and natural hazard mitigation; and (5) small, area-specific meetings on a semi-annual basis at public libraries or other public venues. The purpose of these events would be to distribute literature and educate citizens on natural hazards and hazard mitigation, and to obtain comments and feedback regarding the mitigation action items that can be pursued.

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
7/22/10	Erie County	Meeting	Plan update discussed at meeting of County Legislature	ECDES
February 2011	Town of Brant	Meeting	Announcements at town board meetings	Supervisor and Town Board
7/19/2011	City of Buffalo	Meeting	Public meeting - mitigation strategies for emergency preparedness	Buffalo Fire Department/Disaster Preparedness and Fire Commissioner
Summer 2011	Erie County	Web Posting	Erie County Multi-Jurisdictional Hazard Mitigation Planning Web Site	ECDES
August 2011	Town of Tonawanda	Meeting	Open public Town Board meeting; plan update discussion and participatory resolution passed	Supervisor Anthony Caruna
August 2011	Village of Kenmore	Meeting	Village Board Meeting; board members pass resolution to participate	Mayor Patrick Mang
8/8/2011	Town of Aurora	Meeting	Town Board Meeting, the EC Multi-Jurisdictional Hazard Mitigation Plan was discussed. Meeting was open to the public.	Aurora Town Board and OEM
8/10/2011	Town of Holland	Meeting	Town Meeting accepted to update Erie County Multi-Jurisdictional Hazard Plan	Michael Kasprzyk, Town Supervisor
8/15/2011	City of Buffalo	Meeting	Public meeting - Discussed major fires/emergencies in the City of Buffalo and how to engage/empower	Buffalo Fire Department/Disaster Preparedness and Fire Commissioner
8/15/2011	Town of Collins	Meeting	Resolution by Town Board and discussion regarding the Town's participation in the plan update	Supervisor and Town Board
8/15/2011	Town of Grand Island	Meeting	Town Board Meeting. Public information/input on plan update and open public comment period at town board meeting. Town Board then adopts resolution to participate in plan update.	Town Supervisor
8/15/2011	Town of Grand Island	Newspaper Article	Article posted in islegrande.com, local online newspaper, regarding the Town Board's meeting and its election to participate in the plan update.	Town Supervisor
8/15/2011	Village of East Aurora	Newspaper Article	Article about the plan update in the East Aurora Advertiser	East Aurora Advertiser
8/15/2011	Village of Sloan	Meeting	Village authorizes participation in the update; signs statement of authority to participate	Mayor of Sloan and Emergency Manager
8/18/2011	Village of Williamsville	Memo	Wrote memo to village Board outlining the Plan update, handed out associated materials.	Lynda Jua
8/20/2011	Town of Boston	Meeting	Met and discussed plan and details of completion	Emergency services
8/22/2011	Village of Depew	Meeting	Board meeting, open to public. Plan update was discussed and board authorized Village's participation.	Village Administration and Emergency Management Director
8/24/2011	Town of Eden	Meeting	Erie County Multi-Jurisdictional Hazard Mitigation Plan	Disaster Preparedness Coordinator for Town of Eden
8/24/2011	Town of Newstead	Meeting	Discussed Plan with Peers	Erie County Emergency Services, Newstead Disaster Coordinator
8/24/2011	Town of Sardinia	Meeting	Explain Plan	Homeland Security D. Montgomery DC, Dan Miller, Councilman
8/24/2011	Village of Akron	Meeting	Discussed Plan with Peers, also fire chief	Disaster Coordinator, Akron Fire Chief, Erie County Emergency Services, Peer Disaster Coordinators

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
8/24/2011	Village of Sloan	Meeting	Open public village board meeting; plan update discussed and resolution passed to participate	Mayor and Board of Trustees
8/25/2011	Town of Alden	Fact Sheet Posting	Posted Fact Sheet on public notice board at Town Hall	Alden OEM - Deputy Coordinator
8/25/2011	Village of Alden	Fact Sheet Posting	Fact Sheet was posted on public boards at Village Hall	Emergency Management - Deputy Coordinator
8/30/2011	Town of Cheektowaga	Meeting	Town Board meeting, open to public, plan discussed and board passed resolution to participate	Town Board and Town Attorney
8/31/2011	Town of Boston	Meeting	Discussed Priority hazards and long term goals	Sam Crotty - EM; Martin Ballor - Supervisor
September 2011	Town of Amherst	Fact Sheet Posting	Fact sheet posting in the municipal building and libraries.	James Zymanek, Emergency Services
September 2011	Town of Evans	Fact Sheet Posting	Fact sheet posting at town hall	James Glass, resident and ECDES Coordinator
9/1/2011	Town of Cheektowaga	Meeting	Talked about plan updated and handed out fact sheet	Town Emergency Manager and Emergency Planning Committee
9/2/2011	Town of Grand Island	Web Posting	Link to the County's mitigation plan update page posted on the Grand Island Town website.	Emergency Services Coordinator
9/6/2011	Town of Collins	Meeting	Report to Town Board and presentation of information presented at the Kickoff Meeting.	Supervisor
9/8/2011	Town of Sardinia	Meeting	Town Board meeting to explain plan.	Town Board Member Dan Miller, Councilman
9/9/2011	Town of Boston	Meeting	Resolution of participation and discussion of plan at Town Board meeting	Jay Broadway - Councilman and Gene Wieskowski - Deputy EM/ Councilman
9/9/2011	Village of Gowanda	Meeting	Village Board Meeting	Passing out plan facts, talking about Natural Hazards.
9/10/2011	Town of Amherst	Community Event	Community Open House at Williamsville Fire Dept. We set up an informational booth for our office at this event. The event brings in over 1000 people. We had the fact sheet available and had a few inquiries as to the content of the fact sheet.	Dominic Creamer from Emergency Services
9/12/2011	Village of Angola	Meeting	Village Board meeting. Explanation of the plan update process. Mayor established MJHMP Committee.	Village Board
9/12/2011	Village of Williamsville	Meeting	Village Board meeting. Plan update discussed, and passed resolution authorizing the Village to be a participant in the update.	Lynda Jua/ Village Board
9/13/2011	Town of Eden	Meeting	Two Disaster Preparedness Coordinators for the Town of Eden meet to inform Town Supervisor of schedule	Town Supervisor, Town Board and Disaster Preparedness Coordinators
9/14/2011	Village of Angola	Newspaper Article	Article about the plan update in The Sun newspaper	The Sun
9/14/2011	Erie County	Meeting	Plan update discussed at LEPC meeting – open to the public, and announced in local newspaper	ECDES
9/14/2011	Village of Angola	Meeting	Meeting of MJHMP Committee. Discussed possible disasters that may occur in the Village.	Village of Angola MJHMP Committee
9/14/2011	Town of Aurora	Meeting	Outlined for Village and Town Boards the need for the plan and participation therein.	Town of Aurora OEM - Deputy, Planning

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
9/14/2011	Town of Sardinia	Meeting	Town Board meeting; plan update explained	Dan Miller, Councilman
9/14/2011	Village of East Aurora	Meeting	Outlined for Village and Town Boards the need for the need for the plan and participation therein.	OEM (Note- Town and Village have a combined OEM; under mutual aid agreement, EM services provided by Town on behalf of Village)
9/15/2011	Village of Depew	Social Media	Posting of notice regarding plan update on Depew OEM Facebook page	Emergency Management Online
9/17/2011	Town of Boston	Discussion	Discussion of Hazard Recognition	Sam Crotty - EM
9/19/2011	Village of Angola	Meeting	MJHMP Committee meeting. Discussed inviting utilities, businesses, railroad, and emergency services.	Village of Angola MJHMP Committee
9/19/2011	City of Lackawanna	Meeting	Presentation to City Council and Public at Regular Scheduled Council Meeting of September 19, 2011	Ralph D. Miranda & Richard Startek
9/19/2011	City of Lackawanna	Web Posting	Information on plan Update & Link to Erie County Web Page Posted on City Web Site, www.ci.lackawanna.ny.us	City Clerk
9/20/2011	City of Lackawanna	Newspaper Article	Plan Update Mentioned in Buffalo News Article on Council Action	Ralph D. Miranda
9/21/2011	City of Lackawanna	Meeting	Presentation to Lackawanna Chamber of Commerce at Regular Scheduled Meeting of Sept. 21, 2011	Ralph D. Miranda
9/21/2011	Town of Boston	Meeting	Town Board Meeting - Discussion of plan update, sought input of players, discussed EMP	Jay Broadway - Councilman and Gene Wieskowski - Deputy EM/ Councilman
9/24/2011	Town of Alden	Community Event	Safety Day at local farmers market. Had Fact Sheet available and answered questions that anyone had.	Alden OEM - Coordinator
9/24/2011	Town of Boston	Social Media	Sought input via Facebook and Twitter medium	Sam Crotty - EM
9/24/2011	Village of Alden	Fact Sheet Distribution	Passed out fact sheet and answered questions anyone had regarding plan update	Emergency Management - Coordinator
9/26/2011	Village of Angola	Meeting	MJHMP Committee meeting. Continued discussion on possible disasters. Assigned contacts for evacuation plans and possible members.	Village of Angola MJHMP Committee
9/27/11	Erie County	Meeting	Plan update discussed at Disaster Preparedness Advisory Board meeting	ECDES
9/27/2011	Village of Angola	Meeting	Visit with C.A.O. Discussed evacuation plans with area coordinator and made arrangements to receive a copy.	Board Member Kinn
9/27/2011	Village of Depew	Social Media	'Tweet' sent via Depew OEM Twitter account directing people to the Erie County OEM Website Hazard Mitigation Planning page	Emergency Management Online
9/28/2011	Town of Eden	Meeting	Agenda Item of Town Board Meeting - Discussion held by Town Board on importance of this plan update	Town Board
9/28/2011	Town of Holland	Fact Sheet Posting	Fact Sheet posted on Holland Post Office bulletin board	Howard Smith, Disaster Coordinator
9/2/11-9/30/11	City of Buffalo	Press Conference	Press conference with City and County officials highlighting scheduled activities for Natural Preparedness Month and subsequent activities	Citizen Preparedness Workgroup, BEN UASI, and Fire Commissioner

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
October 2011	Town of Hamburg	Public Notice	Notice of Town Participation in the Multi-Jurisdictional Hazard Mitigation Plan announced in its prefiled agenda for November 14 th public board meeting.	Steve Walters, Hamburg Town Supervisor; Glenn Zawierucha - Town Emergency services
October 2011	Town of Hamburg	Web Posting	Posting on Town website of the town's involvement in the MJHM Plan; including the first plan update, plus a link to Erie County's website.	Donna Gavin, Town of Hamburg computer tech.
October 2011	Village of Kenmore	Web Posting	Posted plan announcement on Village web site and requested comments during the month of October 2011	Emergency Services Coordinator Captain William Phillips
October 2011	Town of Orchard Park	Fact Sheet Posting	Fact Sheet was posted on notice board in municipal Building	Town Clerk
October 2011	Town of Orchard Park	Web Posting	Information about the plan update was posted on the Town web page.	Webmaster
October 2011	Town of Tonawanda	Web Posting	Announcement of plan update posted on Town web site and requested comments during the month of October.	Emergency Services Coordinator Dennis Carson
October 2011	Village of Hamburg	Fact Sheet Posting	Posted on Village billboard information regarding the hazard mitigation plan. Billboard located at Village Hall.	Ric Dimpfl, Emergency Coordinator
October 2011	Village of Orchard Park	Fact Sheet Posting	Fact Sheet was posted on notice board in municipal Building	Village Clerk
10/3/2011	Town of Amherst	Meeting	Town Board Meeting. Short presentation at work session and then had agreement approved to work with Erie County and presented fact sheet announcing its availability to residents in the municipal building and libraries.	James Zymanek from Emergency Services
10/3/2011	Town of Newstead	Meeting	Met with Newstead Town Board to Discuss/Review update process and solicit input from public and stakeholders. Open work session.	Disaster Coordinator, Newstead Town Board
10/3/2011	Village of Akron	Meeting	Met with Village Board to Discuss/Review Plan Update Process and Solicit Input	Disaster Coordinator, Akron Village Board
10/3/2011	Village of Akron	Meeting	Public Input invited; plan update discussed at public board meeting. Statement and discussion made at public village board meeting about plan update and how public can participate.	Akron Village Clerk, Village Board
10/4/11	Erie County	Meeting	Plan update discussed at County Sewer District Board of Managers meeting (District No. 8)	Deputy Commissioner, Erie County, Div. of Sewerage Management
10/4/2011	Village of Angola	Meeting	Visit with C.A.O	
10/4/2011	Town of Newstead	Fact Sheet Posting	Educational materials, poster, flyers offered to public at Newstead Town Hall	Newstead Town Clerk
10/4/2011	Town of Newstead	Web Posting	Information posted on Town official website.	Newstead Town Clerk
10/4/2011	Village of Akron	Fact Sheet Posting	Educational materials, poster, flyers offered to public at Akron Village Hall.	Akron Village Clerk
10/4/2011	Village of Akron	Web Posting	Information posted on Village of Akron official website.	Akron Village Clerk
10/4/2011	Village of East Aurora	Meeting	Public meeting with school board concerning vulnerability, hazards, and need for planning	OEM
10/5/2011	Town of Elma	Meeting	Town Board meeting; open discussion of plan review procedures	Elma Town Board

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
10/5/2011	Village of Blasdell	Meeting	Mitigation Plan presented to Village Board outlining its purpose and implementation. Asked Board Members to submit any ideas for success of plan.	Village of Blasdell Emergency Manager
10/5/2011	Village of Akron	Newspaper Article	Article about the plan update in The Buffalo News	The Buffalo News
10/6/2011	Town of Amherst	Social Media	Posted Fact Sheet to Town Facebook page for community review	Dominic Creamer
10/6/2011	Town of Amherst	Web Posting	Posted Fact sheet to Town homepage for community review	Dave Willer, Town IT Department
10/6/2011	Village of Angola	Meeting	Meeting of MJHMP Committee. Discussed setup of shelters and reviewed evacuation plans.	Village of Angola MJHMP Committee. Additional attendees included Fire Chief, Village Attorney.
10/7/11	Erie County	Meeting	Plan update discussed at County Sewer District Board of Managers meeting (District No. 1)	Deputy Commissioner, Erie County, Div. of Sewerage Management
10/7/2011	Village of Williamsville	Meeting	Disaster Coordinator reviewed Plan update materials and requirements with Village Board	Lynda Jua/ Village Board and Jim Zymanek, Disaster Coordinator
10/8/2011	Town of Amherst	Community Event	Fire Department Open Houses information tables at Main Transit FD and Ellicott Creek FD. Staffed information tables at these open houses allowing residents to comment or ask questions. Fact sheets available for pick up. Had contact with over 500 residents.	James Zymanek and Dominic Creamer
10/10/2011	Town of Newstead	Meeting	Public input invited; plan update discussed at public board meeting. Statement and discussion made at public village board meeting about plan update and how public can participate	Newstead Town Board, Newstead Town Clerk
10/11/11	Erie County	Meeting	Plan update discussed at County Sewer District Board of Managers meeting (District No. 6)	Deputy Commissioner, Erie County, Div. of Sewerage Management
10/11/2011	Town of Eden	Meeting	Public meeting to gain public and officials thoughts on Mitigation Plan - October 11 at 7:30 pm in Town Hall Conference Room.	Supervisor and Town Disaster Coordinators
10/11/2011	Town of Marilla	Work Session	Marilla Town Board Work Session. Discussed Haz Mat Mitigation, Winter Storm Issues	George Gertz, Town Council members
10/11/2011	Village of Depew	Meeting	Board meeting, open to public. Update report presented to Board on the plan update.	Village Administration and Emergency Management Director
10/11/2011	Village of Williamsville	Meeting	Discussed Plan Update at Village Board meeting. Had handouts of fact sheet for residents; discussed places where residents could obtain additional information (Village Hall, website - village and county).	Lynda Jua/ Village Board
10/12/11	Erie County	Meeting	Plan update discussed at County Sewer District Board of Managers meeting (District No. 4)	Deputy Commissioner, Erie County, Div. of Sewerage Management
10/12/2011	Town of Elma	Work Session	Elma Town Board open work session. Open discussion of plan review procedures	Elma Town Board
10/12/2011	Village of Blasdell	Meeting	Discussed the plan at meeting of Village Planning Board. Asked for input from the board.	Village of Blasdell Emergency Manager
10/13/11	Erie County	Meeting	Plan update discussed at County Sewer District Board of Managers meeting (District No. 2)	Deputy Commissioner, Erie County, Div. of Sewerage Management

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
10/13/2011	Town of Eden	Meeting	Public meeting to gain public and officials thoughts on Mitigation Plan - October 13 at 7:30 pm in Town Hall Conference Room.	Supervisor and Town Disaster Coordinators
10/13/2011	Town of Marilla	Meeting	Marilla Town Board Meeting. Presented information to public on Haz Mat Mitigation, Natural Gas Leaks, Utility Failure	George Gertz, Town Council members
10/14/2011	Village of Depew	Work Session	Meeting / working session to complete plan update worksheets	Village of Depew administration and select department heads
10/15/2011	Village of Gowanda	Fact Sheet Posting	Hazard Mitigation Plan Update Sheets	Village Clerk's Office and Public Library
10/17/2011	Town of West Seneca	Meeting	Address the general public for any concerns	J. Gullo, West Seneca Office of Disaster Preparedness
10/17/2011	Village of Akron	Meeting	Public Input invited; plan update discussed at public board meeting. Statement and Discussion made at public village board meeting about plan update and how public can participate	Akron Village Clerk, Village Board
10/17/2011	Village of Blasdell	Newspaper Article	Submitted newspaper article on the plan and purposes to two local newspapers, the Hamburg Sun and Front Page.	Village of Blasdell - Administrator
10/18/2011	Town of Eden	Work Session	Reviewing/completing all forms in preparation for October 19 meeting	Deputy Supervisor and Town Disaster Coordinators
10/18/2011	Town of West Seneca	Discussion	Spoke to representatives from general public for input	J. Gullo, West Seneca Office of Disaster Preparedness
10/19/11	Erie County	Meeting	Plan update discussed at County Sewer District Board of Managers meeting (District No. 5)	Deputy Commissioner, Erie County, Div. of Sewerage Management
10/19/2011	City of Lackawanna	Newspaper Article	Article in Official City Newspaper, <i>The Front Page</i> . Article in newspaper about plan update appeared on page 1.	Ralph D. Miranda
10/19/2011	Town of Aurora	Work Session	Reviewed the required elements of the Town Disaster Mitigation Plan	Town of Aurora OEM - Deputy, Communications and Deputy, Planning
10/19/2011	Town of Boston	Work Session	Question and clarification meeting overview of activities	Sam Crotty and URS
10/19/2011	Town of Eden	Web Posting	Added comment to website of Town of Eden participation and links to URL address of Erie County Hazard	Deputy Supervisor
10/19/2011	Town of Eden	Work Session	Meeting to review and complete all forms	Deputy Supervisor and Town Disaster Coordinators
10/19/2011	Town of Orchard Park	Meeting	Town Board Meeting, the EC Multi-Jurisdictional Hazard Mitigation Plan was discussed and the public was encouraged to participate by asking questions during the meeting and after by contacting the Disaster Coordinator	Town Supervisor
10/19/2011	Village of East Aurora	Work Session	Reviewed the required elements of the Town Disaster Mitigation Plan	OEM (Note- Town and Village have a combined OEM; under mutual aid agreement, EM services provided by Town on behalf of Village)
10/20/2011	Town of Alden	Newspaper Article	Placed article in local Alden Advertiser about plan update and where more information could be found.	Alden OEM - Deputy Coordinator

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
10/20/2011	Town of Cheektowaga	Fact Sheet Posting	Hard copies of the fact sheet were posted on town hall notice boards.	Cheektowaga Emergency Manager
10/20/2011	Town of Cheektowaga	Web Posting	Electronic copy of plan update fact sheet was posted on the town's web site.	Cheektowaga Emergency Manager
10/20/2011	Town of Marilla	Meeting	Town of Marilla Planning Board discussed Haz-Mat Mitigation, Blight, Crop Infestation	Jay Walkowiak, Chair and Planning Board
10/20/2011	Village of Alden	Newspaper Article	Placed article in local Alden Advertiser about plan update and where to find more information	Emergency Management - Deputy Coordinator
10/21/2011	Town of Aurora	Meeting	Discussion of the impact of NFPA 914 on the protection of National Historic Buildings - Roycroft.	Town of Aurora OEM - Deputy, Planning
10/21/2011	Village of East Aurora	Meeting	Discussion of the impact of NFPA 914 on the protection of National Historic Buildings - Roycroft.	OEM
10/24/2011	Town of Colden	Fact Sheet Posting	Hard copies of the fact sheet were posted on the town hall community board.	Town Emergency Manager
10/24/2011	Town of Colden	Meeting	Plan update discussed at an open public town budget workshop.	Town Supervisor
10/24/2011	Town of Newstead	Meeting	Public Input invited; plan update discussed at public board meeting. Statement and discussion made at public village board meeting about plan update and how public can participate	Newstead Town Board, Newstead Town Clerk
10/25/2011	City of Tonawanda	Fact Sheet Posting	Plan update fact sheet was issued to Board of Education officials.	OEM
10/25/2011	Town of Colden	Meeting	Plan update discussed at a public meeting, including Planning and Town Highways, asking for input and comments.	Town Emergency Manager
10/25/2011	Village of Lancaster	Meeting	Village Jurisdictional Assessment Team meeting	Scott Kuhlmeier, Director of Emergency Management
10/26/2011	City of Tonawanda	Fact Sheet Posting	Posted hard copies of the plan update fact sheet at municipal buildings.	Office of Emergency Management
10/26/2011	City of Tonawanda	Web Posting	Established a link to the plan on the City's web site.	Office of Emergency Management
10/26/2011	Village of Blasdell	Newspaper Article	Article about the plan update in The Front Page	The Front Page
10/27/2011	Town of Eden	Work Session	Reviewing revised forms in preparation for conclusion	Town Disaster Coordinators
10/27/2011	Town of West Seneca	Newspaper Article	Article about the plan update in The West Seneca Bee	The West Seneca Bee
10/28/2011	Village of Sloan	Meeting	Informational seminar held at the Cheektowaga Senior Center for Sloan/Cheektowaga residents on the mitigation plan update	Emergency Manager
10/30/2011	Town of Lancaster	Web Posting	Adding a link to Erie County Multi-Jurisdictional Hazard Mitigation Plan	Town of Lancaster Emergency Management; Town Clerk for the Town of Lancaster Web-Site
11/1/2011	City of Tonawanda	Meeting	Discussed and explained details of the plan update with elected officials at Common Council meeting that was attended by the general public.	Office of Emergency Management
November 2011	Town of Concord	Fact Sheet Posting	Fact sheet discussed and posted	Emergency Services Coordinator
November 2011	Village of Kenmore	Meeting	Mitigation plan update discussed/reviewed by the Village of Kenmore Citizen Advisory Panel and the Hazardous Materials Advisory Council	Emergency Services Coordinator Captain William Phillips

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
November 2011	Town of Tonawanda	Meeting	Plan update discussed and reviewed by Town of Tonawanda Citizen Advisory Panel	Emergency Services Coordinator Dennis Carson
November 2011	Village of Hamburg	Meeting	Board meeting with mayor and trustees explaining plan update. Information about the plan was distributed. Board passed resolution to participate. Board meetings are open to the public.	Ric Dimpfl, Emergency Coordinator
November 2011	Village of Hamburg	Newspaper Article	Had hazard mitigation plan update information published in local newspaper. Met with editor and had article published letting the public know about the resolution to participate, and the basics of the plan.	Ric Dimpfl, Emergency Coordinator
November 2011	Village of Hamburg	Web Posting	Information about the plan update was posted on the Village web site, with contact info for questions.	Village Administrator and Rick Dimpfl, Emergency Coordinator
November 2011	Village of Sloan	Fact Sheet Posting	Hard copies of the fact sheet on the plan update were posted on notice boards at the Village Municipal Building and the Community Center.	Village clerical staff
November 2011	Village of Sloan	Web Posting	Fact sheet on the plan update was posted on the Village web site.	Village clerical staff
November 2011	Village of Springville	Fact Sheet Posting	Hard copies of the fact sheet on the plan update were discussed and posted by the Emergency Services Coordinator	Emergency Services Coordinator
11/1/2011	Town of Lancaster	Newspaper Article	Notification to Public of update to the Erie County Multi-Jurisdictional Hazard Mitigation Plan Update	Town of Lancaster Emergency Management
11/3/2011	City of Buffalo	Meeting	Public hearing - Common Council held discussions on recent emergencies and mitigation strategies	Buffalo Common Council
11/3/2011	Town of Cheektowaga	Meeting	Final comments on plan updates	Town Emergency Manager and Emergency Planning Committee
11/3/2011	Town of Colden	Meeting	Public Hearing - Plan update discussed at an open public town budget hearing.	Town Supervisor
11/3/2011	Village of Depew	Newspaper Article	Newspaper article in the Cheektowaga Bee regarding the plan update	Deputy Village Manager
11/9/2011	Erie County	Meeting	Plan update discussed at LEPC meeting – open to the public, and announced in local newspaper	ECDES
November 2011	Town of Hamburg	Meeting	Town Participation in the Multi-Jurisdictional Hazard Mitigation Plan discussed at November 14 th public board meeting.	Steve Walters, Hamburg Town Supervisor; Glenn Zawierucha - Town Emergency services
11/15/2011	Village of Gowanda	Web Posting	Plan update info posted on www.villageofgowanda.com and www.erie.gov/disaster	Village Clerk's Office
11/17/2011	Village of Lancaster	Social Media	Posted project details and information on OEM Facebook page.	Scott Kuhlmeier, Director of Emergency Management
11/17/2011	Village of Lancaster	Web Posting	Posted project details and information on OEM website	Scott Kuhlmeier, Director of Emergency Management
December 2011	Village of Lancaster	Web Posting	Posted project details and information on Village website.	Mike Stegmeyer, Cleric
12/6/2011	Village of North Collins	Meeting	Meeting to distribute educational materials and provide opportunity for discussion of the hazard mitigation plan. Copies of the fact sheet were distributed to attendees.	Village Board, Mayor George

Table 1.6
Summary of Jurisdiction Outreach Activities

Date	Jurisdiction	Action Type	Action Details	Action Lead
12/14/2011	Town of North Collins	Meeting	Meeting to distribute educational materials and provide opportunity for discussion of the hazard mitigation plan. Copies of the fact sheet were distributed to attendees.	Town Board, Town Supervisor O'Boyle
10/1/11-10/31-11	City of Buffalo	Community Event	Open houses for fire department scheduled for throughout the month distributing fire extinguishers, smoke detectors, and various planning preparedness information	Buffalo Fire Department and Mayor's Office
10/4/2011 and 10/6/2011	Village of Akron	Newspaper Article	Articles run in Buffalo News and Akron Bugle about HMP update process. Public input invited	Buffalo News, Akron Bugle
10/5/2011 and 10/6/2011	Town of Newstead	Newspaper Article	Articles run in Buffalo News and Akron Bugle about HMP Process. Public input invited	Buffalo News, Akron Bugle
12/14/11-12/15/11	Village of Lancaster	Meeting	Meeting held regarding planning documents	OEM, DPW, Community Development
February - December 2011	Town of Brant	Fact Sheet Posting	Flyers posted in town hall and post offices	Town Clerk and Town Board
Throughout 2011	Town of Brant	Meeting	Discussed plan at various meetings - planning board, code officers, board members.	OEM and Town Board
2/22/12	Town of Clarence	Meeting	The hazard mitigation plan update was discussed at a work session of the Town Board of the Town of Clarence	Councilman Casilio, David Baumler (Emergency Services), and David Bissonette (Disaster Coordinator)
2/6/2012	Town of Collins	Meeting	Discussion at Town Board meeting. Status of and need for inclusion in the plan	Supervisor and Town Board
2/6/2012	Town of Collins	Newspaper Article	Fact Sheet and overview given to newspaper. Local media asked to include information in news articles.	Supervisor and Town Board
2/8/2012	Town of Collins	Fact Sheet Posting	Hazard mitigation plan overview and fact sheet posted in Town Hall	Town Clerk
2/9/2012	Town of Collins	Web Posting	Hazard mitigation plan overview and link to county plan posted on Town web site.	Town Supervisor and IT Committee
7/24/2012	Erie County	Meeting	Plan update discussed at Disaster Preparedness Advisory Board meeting	ECDES
9/25/12	Erie County	Meeting	Plan update discussed at Disaster Preparedness Advisory Board meeting	ECDES
11/26/13	Erie County	Meeting	Plan update discussed at Disaster Preparedness Advisory Board meeting	ECDES
1/28/14	Erie County	Meeting	Plan update discussed at Disaster Preparedness Advisory Board meeting	ECDES

Opportunities for Involvement of Other Stakeholders in the Plan Update Process

In order to meet Federal requirements, the plan development process must be open to stakeholders beyond planning group members and the general public. That is, opportunities must be available for other stakeholders (such as businesses, neighboring communities, academia, other relevant private and non-profit interests, and other interested parties) to become involved in the planning process.

As with the general public, other stakeholders must be provided with some variety of means to not only learn about the process that the Planning Committee is undertaking, but to voice concerns and to provide input throughout the planning process. With support and guidance from URS, each JAT took the lead in pursuing a range of activities to: (a) alert other stakeholders to the fact that the planning was working to develop this Hazard Mitigation Plan, and (b) provide other stakeholders with a forum to ask questions, and to submit comments and/or suggestions on the process or directly participate.

The CPG undertook many actions to provide targeted outreach to key stakeholder entities as part of the planning team's overall outreach efforts. These activities were undertaken to provide stakeholders with an opportunity to be involved in the plan update process. Various stakeholders were invited as participants, and given the chance to provide input and to become engaged. Stakeholders that were targeted represented a wide range of agencies, organizations, and jurisdictions and included (but were not limited to) local and regional agencies involved in hazard mitigation, agencies that have the authority to regulate development; and neighboring communities. These are summarized in **Table 1.7**. Since there was limited response to the initial outreach efforts, CPG members will consider more targeted outreach to the public and other stakeholders during the plan maintenance phase to elicit feedback. This could include activities such as: (1) increased use of social media; (2) extensive outreach to local media outlets (television, radio, and print media partners) to prepare stories to help promote widespread public involvement and awareness, and to elicit feedback and comments; (3) formal presentations to governing bodies regarding the hazard mitigation plan (in an open public forum setting); (4) and targeted public/stakeholder events such as roundtables and public forums specifically regarding the plan, and natural hazard mitigation; and (5) small, area-specific meetings on a semi-annual basis at public libraries or other public venues. The purpose of these events would be to distribute literature and educate people on natural hazards and hazard mitigation, and to obtain comments and feedback regarding the mitigation action items that can be pursued. The CPG should consider expanding the list of stakeholders to include SUNY Buffalo and other academic stakeholders.

Table 1.7
Summary of Jurisdiction Outreach Activities to Key Stakeholders

Date	Jurisdiction	Action Type	Action Details	Action Lead
8/1/2011	City of Buffalo	Meeting	Met with residential area manufacturers (private industry) to identify mitigation strategy for neighborhoods	Buffalo Fire Department/Disaster Preparedness and Fire Commissioner
August 2011	Town of Concord	Meeting	Stakeholder meeting - Reviewed plan and approved adoption of comprehensive county plan	Emergency Services Coordinator
August 2011	Village of Springville	Meeting	Stakeholder meeting - Reviewed aspects of plan update and agreed upon participation in county-wide multi-jurisdictional process	Emergency Services Coordinator
8/12/2011	City of Buffalo	Meeting	Meeting With Buffalo/Erie/Niagara (BEN) UASI	Citizen Preparedness, BEN UASI, and Fire Commissioner
8/25/2011	Town of Newstead	Conference Call	Spoke to Akron and Newstead Fire Chiefs in Conference Call about the process and to encourage thought and input	Disaster Coordinator, Akron and Newstead FD Fire Chiefs
8/25/2011	Village of Akron	Conference Call	Spoke to Akron and Newstead Fire Chiefs in Conference Call about the process and to encourage thought and input	Disaster coordinator, Fire Chiefs (Akron and Newstead FD's)
8/29/2011	Town of Holland	Meeting	Holland Fire Department Line Officers Meeting. Planning of department business, monthly training, emergency management update	Fire Chief Michael O'Connor
8/30/2011	Town of Newstead	Meeting	Met with Akron Fire Chief to discuss potential hazard sites and plan update process	Disaster Coordinator, Akron Fire Chief, Newstead Fire Chief, & Firefighters
8/30/2011	Village of Akron	Meeting	Met with Akron Fire Chief to discuss potential hazard sites and plan update process	Disaster Coordinator, Akron Fire Chief, Akron Firefighters
9/6/2011	Village of Blasdel	Meeting	Discussed the plan with members of the fire department	Village of Blasdel Emergency Manager
9/8/2011	Town of Amherst	Meeting	Presented details of plan update to Town Fire Chiefs Association and also gave them fact sheets to distribute through their fire halls. 10 FD's in town and over 800 firefighters.	Dominic Creamer from Emergency Services
9/9/2011	City of Lackawanna	Email Coordination	Communication with Lackawanna Chamber of Commerce. Information on Plan Update E-mailed Ex. Director of Chamber in order to be placed on Sept. Meeting Agenda to give a presentation.	Ralph D. Miranda, Director of Development
9/15/2011	Town of Newstead	Meeting	Coordination with local industry: Met with Safety team and facility managers from local Haz Mat Facility (Perry's Ice Cream) - Their facility has a major impact on local Village of Akron and Town of Newstead	Disaster Coordinator, Staff from large local industrial site
9/15/2011	Town of Orchard Park	Meeting	First meeting of the Emergency Disaster Team for the Town of Orchard Park. The team is made up of the disaster coordinator who represents both the Town and Village of Orchard Park, two assistant disaster coordinators, Fire District Chief and Police Lieutenant.	Disaster Coordinator
9/15/2011	Village of Akron	Meeting	Met with local industry safety team and facility managers from local Haz Mat Facility (Perry's Ice Cream) - Their facility has a major impact on local village and town	Disaster Coordinator, Staff from Perry's Ice Cream
9/15/2011	Village of Orchard Park	Meeting	First meeting of the Emergency Disaster Team for the Town of Orchard Park. The team is made up of the disaster coordinator who represents both the Town and Village of Orchard Park, two assistant disaster coordinators, Fire District Chief and Police Lieutenant.	Disaster Coordinator

Table 1.7
Summary of Jurisdiction Outreach Activities to Key Stakeholders

Date	Jurisdiction	Action Type	Action Details	Action Lead
9/24/2011	Town of Newstead	Meeting	Met with Erie County Emergency Services, Emergency Management Peers and County- level Stakeholders	Erie County Emergency Services
9/24/2011	Village of Akron	Meeting	Met with Erie County Emergency Services, Emergency Management Peers and County- level Stakeholders	Erie County Emergency Services
9/24/2011	Village of Blasdell	Meeting	Discussed the plan with members of the firemen's exempt organization; purpose of the plan and its implementation	Village of Blasdell Emergency Manager
9/25/2011	Town of Sardinia	Email Coordination	Fire Department E-Mail	Mike Shaw, Fire Chief
9/26/2011	Town of Holland	Meeting	Senior citizens meeting and lunch	Gloria Petri, President
9/27/2011	Village of Angola	Meeting	Visit with C.A.O. Discussed evacuation plans with area coordinator and made arrangement to receive a copy.	Board Member Kinn
9/27/2011	Village of Angola	Meeting	Update meeting on MJHMP with County	Disaster Coordinator
9/27/2011	City of Buffalo	Meeting	Stakeholders Meeting - Disaster Preparedness Advisory Board and Erie County Disaster Coordinators Association; Presentation by the Red Cross on Sheltering, Erie County All Hazards Plan, 400 MHz project.	Chairman James J. Zymanek
9/27/2011	City of Lackawanna	Meeting	Disaster Preparedness Advisory Board Meeting. Presentations by Red Cross on Sheltering, and Erie County Health Dept. on upcoming Vaccination Clinics for H1N1	Ralph D. Miranda
9/27/2011	Town of Boston	Meeting	DPAB Meeting - Discussed plan during meeting of County Emergency Managers	Sam Crotty - EM
9/27/2011	Town of Concord	Meeting	Disaster Preparedness Advisory Board and Erie County Disaster Coordinators Association	Emergency Services
9/27/2011	Town of Eden	Meeting	Update by county officials of what steps must still be undertaken	Disaster Preparedness Coordinator
9/27/2011	Town of Elma	Meeting	Meeting and open discussion of plan review procedure	Emergency Services
9/27/2011	Town of Holland	Meeting	Report on all hazard mitigation plan updates	Jerry Whittington Jr.
9/27/2011	Town of Orchard Park	Meeting	Disaster Preparedness Advisory Board and Erie County Disaster Coordinators Association; Presentation by the Red Cross on Sheltering, Erie County All Hazards Plan, 400 MHz project.	Chairman James J. Zymanek
9/27/2011	Town of Sardinia	Meeting	Senior citizens meeting and dinner	Dan Miller, Councilman
9/27/2011	Village of Orchard Park	Meeting	Disaster Preparedness Advisory Board and Erie County Disaster Coordinators Association; Presentation by the Red Cross on Sheltering, Erie County All Hazards Plan, 400 MHz project.	Chairman James J. Zymanek
9/27/2011	Village of Springville	Meeting	Disaster Preparedness Advisory Board and Erie County Disaster Coordinators Association	Emergency Services
Sept./Oct. 2011	Seneca Nation	Meeting	At an emergency managers' meeting, ECDES spoke directly with representatives from the Seneca Nation and invited them to participate with the county in its multi-jurisdictional plan. Seneca Nation emergency management representatives declined, indicating that the Seneca Nation was preparing its own plan.	ECDES
10/4/2011	Village of Angola	Meeting	Visit with C.A.O. Received copy of evacuation plan	Board Member Kinn

Table 1.7
Summary of Jurisdiction Outreach Activities to Key Stakeholders

Date	Jurisdiction	Action Type	Action Details	Action Lead
10/4/2011	Town of Aurora	Meeting	Public meeting with school board concerning vulnerability, hazards, and need for planning	Town of Aurora OEM - Deputy, Communications and Deputy, Planning
10/4/2011	Town of Boston	Email Coordination	Canvas Emergency Services Personnel in Town looking for input	Sam Crotty - EM
10/5/2011	Village of Angola	Telephone Query	Telephone call to People, Inc. for evacuation plan for senior citizen housing.	Disaster Coordinator
10/5/2011	Village of Angola	Meeting	Met with School System B&G Superintendent obtained evacuation plans for schools in Village	Disaster Coordinator
10/5/2011	Town of Marilla	Meeting	Meeting with Marilla Fire Co, Inc. Discussed Haz Mat Mitigation, Natural Gas Pipelines	George Gertz
10/6/2011	Town of Marilla	Meeting	Conservation Advisory Board (Town of Marilla) Meeting. Discussed Haz Mat Mitigation, Floodplain Issues	George Gertz, Conservation Advisory Board Members
10/10/11	Village of Angola	Meeting	Visited Holly Apartments. Requested copy of evacuation plan.	Board Member Kinn
10/11/2011	Town of Orchard Park	Meeting	Orchard Park Fire District Board of Fire Commissioners monthly meeting	Disaster Coordinator
10/11/2011	Village of Orchard Park	Meeting	Orchard Park Fire District Board of Fire Commissioners monthly meeting	Disaster Coordinator
10/12/2011	Village of Angola	Meeting	Visited Holly Apartments. Picked up copy of evacuation plan	Board Member Kinn
10/12/2011	Town of Boston	Work Session	Ongoing Communication idea sharing w/ Hamburg Emergency Management wrap up meeting	Sam Crotty - Boston EM and Glen Zawierucha - Hamburg EM
10/12/2011	Town of Newstead	Meeting	Met with Fire Chiefs Re Planning Options and Ideas. Spoke to Fire Chiefs to Discuss more ideas and to solicit more input	Disaster Coordinator, Akron Fire Chief, Newstead Fire Chief
10/12/2011	Town of Newstead	Work Session	Intensive planning meeting with village officials. Met with members of village board, Department heads, also key stakeholders to discuss specifics of plan and to discuss ideas	Disaster Coordinator, Town Supervisor, Clerk/Treasurer, DPW Head, Engineer, Code Enforcement, Town Board Members, CAC Members
10/12/2011	Town of West Seneca	Work Session	Internal Stakeholder - reviewed our hazard Mitigation Plan so we can update	Eric J. Conles, West Seneca Office of Disaster Preparedness
10/12/2011	Village of Akron	Meeting	Discussed with Fire Chief Planning Options and Ideas. Further Discussion with Akron Fire Chief to Discuss to obtain more input	Disaster Coordinator, Akron Fire Chief
10/12/2011	Village of Akron	Work Session	Intensive planning meeting with village officials. Met with members of village board, Department heads, also key stakeholders to discuss specifics of plan and to discuss ideas	Disaster Coordinator, Mayor, Clerk/Treasurer, DPW Head, Engineer, code enforcement, stakeholders
10/13/2011	Town of Amherst	Meeting	Presented to Town Fire Chiefs Association and also gave them fact sheets to distribute through their fire halls. 10 FD's in town and over 800 firefighters.	Dominic Creamer from Emergency Services
10/13/2011	Town of Newstead	Meeting	Met with School Safety Committee and informed them of the Process and Solicited Input (Town -wide Stakeholder)	Disaster Coordinator, Fire Chief, Akron Central School Safety Committee
10/13/2011	Village of Akron	Meeting	Met with School Safety Committee; Discussed Process of the Update and Solicited Input	Disaster Coordinator, Fire Chief, Akron Central School Safety Committee

Table 1.7
Summary of Jurisdiction Outreach Activities to Key Stakeholders

Date	Jurisdiction	Action Type	Action Details	Action Lead
10/14/2011	Town of Orchard Park	Meeting	Meeting of the Emergency Disaster Team for the Town of Orchard Park to review the EC Multi-Jurisdictional Hazard Mitigation Plan. The team is made up of the disaster coordinator who represents both the Town and Village of Orchard Park, two assistant disaster coordinators, Fire District Chief and Police Lieutenant.	Disaster Coordinator
10/14/2011	Village of Orchard Park	Meeting	Meeting of the Emergency Disaster Team for the Town of Orchard Park to review the EC Multi-Jurisdictional Hazard Mitigation Plan.	Disaster Coordinator
10/19/2011	Town of Concord	Meeting	Springville Fire Control Chiefs Council Meeting. Area Fire Chiefs and First Responders agencies in attendance	Emergency Services Coordinator
10/19/2011	Village of Springville	Meeting	Springville Fire Control Chiefs Council Meeting. Area Fire Chiefs and First Responders agencies in attendance	Emergency Services Coordinator
10/20/2011	Town of West Seneca	Discussion	Spoke to Emergency Services representatives in town	J. Gullo, West Seneca Office of Disaster Preparedness
10/20/2011	Village of Blasdell	Meeting	Met with Blasdell First Community Support Group. Advised of plan and asked for any input.	Village of Blasdell - Mayor
10/24/2011	Town of Boston	Telephone Query	Telephone query - sought clarification on points discussed 2005 plan	Sam Crotty, Jerry Whittington, and Melissa Cathow
10/27/2011	City of Buffalo	Meeting	Meeting of City of Buffalo Disaster Preparedness Workgroup	Buffalo Fire Department, Disaster Preparedness and Fire Commissioner
10/28/2011	Town of Cheektowaga	Meeting	Talked to a group of seniors about the plan update and posted the fact sheet on the seniors bulletin board	Cheektowaga Emergency Manager
10/28/2011	Village of Sloan	Meeting	Informational seminar held at the senior center on the plan update	Emergency Manager
11/1/2011	City of Buffalo	Meeting	Meeting of the City of Buffalo Disaster Preparedness Workgroup	Buffalo Fire Department, Disaster Preparedness and Fire Commissioner
November 2011	Village of Kenmore	Meeting	Plan update reviewed by Village of Kenmore Citizen Advisory Panel and Hazardous Materials Advisory Council	Emergency Services Coordinator Captain William Phillips
November 2011	Town of Tonawanda	Meeting	Plan update discussed and reviewed by Town of Tonawanda Hazardous Materials Advisory Council	Emergency Services Coordinator Dennis Carson
9/1/11 - 10/10/11	Village of Alden	Stakeholder Letters	Sent out information letter to local stakeholders regarding plan update.	Emergency Management - Deputy Coordinator
9/1/11 - 10/10/11	Town of Alden	Stakeholder Letters	Sent out letters to school, police, fire, EMS, and churches explaining plan and update.	Alden OEM - Deputy Coordinator

In addition, the CPG determined that outreach activities to the general public as summarized in the previous section (**Table 1.6**) would supplement the activities described here, also reaching and providing the same opportunities for other stakeholders such as businesses, neighboring communities, academia, other relevant private and non-profit interests, and other interested parties. While stakeholders were not invited as “participating jurisdictions”, per se, in the same degree as the municipalities – channels of communications were opened with interested stakeholders, who were then kept apprised of the status of the project, and various participating jurisdictions reached out to them for expertise in project development.

To supplement the larger efforts of the CPG, ECDES undertook a separate targeted outreach program to key stakeholder groups at the countywide level. ECDES distributed a letter to 26 key stakeholders on August 10, 2011, to invite them to participate in the plan update process and request their input. Recipients were also invited to attend the August 24, 2011 Kickoff Meeting. Of the 26 stakeholders contacted, 18 represented outside interests involved in hazard mitigation activities or having the authority to regulate development, and eight were county agencies/departments involved in hazard mitigation activities or having the authority to regulate development. The following stakeholders received this letter:

<u>Name</u>	<u>Title/Organization</u>
Turner, Ken	American Red Cross ■
Baker, Chris	Cattaraugus County Emergency Manager
Leone, Jullius	Chautauqua County Emergency Manager
Yaeger, Tim	Genesee County Emergency Manager
Konst, Kathy	Erie County Commissioner of Environment and Planning
Sentz, Gerard	Erie County Commissioner of Highways
Dankert, Carol	Erie County Commissioner of Social Services ●
Fricano Chalmers, Tracy	Erie County Department of Health, Bioterrorism Program
Sentz, Gerard	Erie County Department of Public Works ▲
Levan, Judith	Erie County Disaster Preparedness Advisory Board, Chair ■▲
Mekarski, Cheryl A.	Erie County Department of Information and Support Services
Turner, Gregory J.	Erie County Department of Information and Support Services
McCarten, Daniel	Erie County Local Emergency Planning Committee , Chairman ●■▲
McCartan, Daniel	Erie County Medical Center, Regional Emergency Preparedness Coordinator
Patronik, Scott	Erie County Sheriff's Department
Gaston, Mark	Erie County Soil and Water Conservation District
Wik, Tom	Erie County Water Authority
Dauer, Robert	National Fuel Gas
McQuiggan, Kevin	National Grid ■
Levan, Judith	National Weather Service – Buffalo ■
Jones, Rich	New York State Department of Transportation ■
Ransom, Bill	New York State Electric and Gas
Cecula, John F.	Niagara County Emergency Manager
Reinke, Terry	Niagara Frontier Transportation Authority ●, ■
Shoffstall, Gary	US Army Corps of Engineers, Buffalo District ■
Santoro, Tony	Wyoming County Emergency Manager

The letter asked stakeholders to return one of two Statements of Authority – one expressly indicating a desire to participate and identifying a representative to serve officially as part of the CPG; and another indicated a desire not to participate. As a result of this coordination effort:

- Three of the 26 stakeholders contacted formally responded by returning a signed Statement of Authority to Participate in the plan update process (as noted above with a “●”). No Statement of Authority response was received from the remaining 22 stakeholders.

- Eight of the 26 entities contacted were represented at the plan update Kickoff Meeting on August 24, 2011 (as noted above with a “■”).
- Three of the 26 entities were represented at the CPG Working Session on October 19, 2011 (as noted above with a “▲”).

In September/October of 2011, at an emergency managers’ meeting, ECDES spoke directly with representatives from the Seneca Nation and invited them to participate with the county in its multi-jurisdictional plan. Seneca Nation emergency management representatives declined, indicating that the Seneca Nation was preparing its own plan.

ECDES also discussed the plan update at joint meetings of the Erie County Disaster Preparedness Advisory Board (DPAB) and the Disaster Coordinators on September 27, 2011; July 24, 2012; September 25, 2012; November 26, 2013; and January 28, 2014. The DPAB is a volunteer board. One third of the members are active members of voluntary fire companies and the remainder are elected officials or their representatives, representatives of organizations involved in civil defense and disaster preparedness and other citizens of the county. Typically, the DPAB meetings are not attended by the public; however, anyone is welcome to attend. An announcement is usually not sent to the local newspaper for the DPAB meetings.

ECDES discussed the mitigation plan update process at two meetings of the Erie County Local Emergency Planning Committee (LEPC). The LEPC includes members of the general public as well as key stakeholders. These meetings were held on September 14, 2011 and November 9, 2011. The Erie County LEPC meets bi-monthly at the Erie County Fire Training Academy and its meetings are open to the public and an announcement is sent to the local newspaper for posting.

The LEPC returned a statement of Authority to Participate. SUNY Buffalo is a member of the LEPC. They also attend meetings of the DPAB, though they are not official members of the board.

The Deputy Commissioner of the Erie County Division of Sewerage Management also provided information on the plan update to eight Erie County sewer districts at various meetings in October of 2011 (these meetings were also open to the public), as shown in detail in **Table 1.6**.

To supplement these efforts, ECDES also spoke with members of key stakeholder groups at various times throughout the plan update process on a more ad-hoc basis to alert them to the fact that the plan was under development and to open the door for their participation and feedback.

Review and Incorporation of Existing Plans, Studies, Reports, and Technical Information

In the process of preparing this hazard mitigation plan, many other existing plans, studies, reports, and technical information were evaluated. These sources are noted throughout this report as various topics are discussed. As shown in **Table 1.8**, the development of this hazard mitigation plan included the review and incorporation of data from existing plans, studies, reports, and technical information. Relevant information was referenced or included, as applicable, to form the content of this mitigation plan.

Table 1.8
Review and Incorporation of Data from Outside Sources

Data Source	How Incorporated	Where Incorporated
Readily available on-line information from federal and state agency web sites including: FEMA, NYSEMO, NY State Department of Environmental Conservation, US Forest Service National Avalanche Center, US Geological Survey, National Oceanic and Atmospheric Administration (including National Weather Service and National Climatic Data Center, and the National Severe Storms Laboratory), U.S. Department of Agriculture Natural Resources Conservation Service, U.S. Army Cold Regions Research and Engineering Laboratory, National Drought Mitigation Center Drought Impact Reporter, USGS National Earthquake Information Center, and the US Department of Transportation Federal Highway Authority.	Referenced throughout this report as various topics are discussed. Primarily, these sources were consulted to develop lists of historic occurrences of various hazards as well as areas at risk, probability of future occurrences, and impact information.	Throughout the document, but primarily in Sections 2 and 3.
New York State Hazard Mitigation Plan (2008)	Hazard information including historic occurrences, areas at risk, probability of future occurrences, and impact information. Also: State capabilities that can support local hazard mitigation efforts, State goals and actions (to compare against local goals and actions to ensure that the two go hand-in-hand), etc.	Throughout the document, but primarily in Sections 2 and 3 for hazard information; plus capabilities in Section 4 and goals in Section 5.
FEMA Flood Map Data and Municipal Flood Insurance Studies	Areas susceptible to flooding. Also, FISs included information about local flood protection features. DFIRMs were combined with parcel data in GIS to evaluate the area of the floodplain in each municipality, the value of improvements in each area.	Throughout the document, but primarily in Sections 2 and 3.
New York State Department of Environmental Conservation (NYSDEC) Coastal Erosion Hazard Area (CEHA) Mapping (Towns of Brant, Evans, and Hamburg)	NYSDEC CEHA maps were included directly in the plan, and while the maps are only available as PDFs (not for use in GIS platforms), hand-counts of buildings at risk were performed and summarized.	Throughout the document, but primarily in Sections 2 and 3.
Erie County GIS data	County GIS data included parcel data such as the type of property, its ownership, and the value of land/improvements. This was used to quantify the land area and value of improved property at risk in various hazard areas.	Throughout the document, but primarily in Sections 2 and 3.
Erie-Niagara Framework for Regional Growth (October 2006)	The Framework was used to describe historic land uses and development trends, as well as current and expected future trends.	Throughout the document, but primarily in Sections 2 and 3.

Table 1.8
Review and Incorporation of Data from Outside Sources

Data Source	How Incorporated	Where Incorporated
Erie County Flood Insurance Study	Areas susceptible to flooding. Also, FISs included information about local flood protection features. Q3 data was combined with parcel data in GIS to evaluate the area of the floodplain in each municipality, the value of improvements in each area.	Throughout the document, but primarily in Sections 2 and 3.
Erie County Flood Damage Reduction Measures (HARRP-2000)	The Erie County HARRP-2000 report (Hazard Awareness and Risk Reduction Program) was used to inform a range of possible types of flood risk reduction measures that could be implemented.	Throughout the document, but primarily in Sections 2 and 3.
Erie County Comprehensive Emergency Management Plan (October 2003)	The Erie County CEMP was used to inform the range of hazards that the county is potentially susceptible to.	Throughout the document, but primarily in Sections 2 and 3.
USGS Earthquake History of New York State	Historic earthquake event occurrences	Throughout the document, but primarily in Sections 2 and 3.
NY State Geological Survey NEHRP Soil Class Mapping	The severity of impact of an earthquake can be exacerbated by certain soil types, and soils mapping was used in the earthquake hazard profile to inform the degree to which soil type might exacerbate earthquake impacts in Erie County.	Throughout the document, but primarily in Sections 2 and 3.
NY State Landslide Inventory Mapping	Historic landslide event occurrences. Landslides are more likely to occur in areas where they have happened in the past.	Throughout the document, but primarily in Sections 2 and 3.
USGS National Landslides Program Landslide Mapping	Historic landslide event occurrences. Landslides are more likely to occur in areas where they have happened in the past.	Throughout the document, but primarily in Sections 2 and 3.
USGS Fact Sheet 165-00, Land Subsidence in the United States	Land subsidence hazard maps were evaluated to determine whether land subsidence is a significant hazard in Erie County.	Throughout the document, but primarily in Sections 2 and 3.
National Agricultural Statistics Service, Erie County Profile, 2007	Information regarding agricultural uses in Erie County to characterize how widespread the potential impacts of some hazards might be (drought and hail, for example).	Throughout the document, but primarily in Sections 2 and 3.
New York Agricultural Statistics Service, Erie County Profile, 2002	Information regarding agricultural uses in Erie County to characterize how widespread the potential impacts of some hazards might	Throughout the document, but primarily

Table 1.8
Review and Incorporation of Data from Outside Sources

Data Source	How Incorporated	Where Incorporated
	be (drought and hail, for example).	in Sections 2 and 3.
HAZUS-MH database for emergency facilities and utilities	The database of assets from HAZUS was imported on a GIS platform to determine assets at risk from delineable hazards	Throughout the document, but primarily in Sections 2 and 3.
NYSDEC Inventory of Dams	Dam inventory data was used to quantify the number, type, and hazard ranking of dams in Erie County. (as applicable for the flood hazard)	Throughout the document, but primarily in Sections 2 and 3.
Stanford University National Performance of Dams Program web site	Dam inventory data was used to quantify the number, type, and hazard ranking of dams in Erie County. (as applicable for the flood hazard)	Throughout the document, but primarily in Sections 2 and 3.
U.S. Army Corps of Engineers National Inventory of Dams	Dam inventory data was used to quantify the number, type, and hazard ranking of dams in Erie County. (as applicable for the flood hazard)	Throughout the document, but primarily in Sections 2 and 3.
New York State Historic Preservation Office GIS shape files for state and federally listed historic and cultural resources	These GIS shape files were used to quantify historic and cultural resources in delineable hazard areas.	Throughout the document, but primarily in Sections 2 and 3.
The NYS Park System: An Economic Asset to the Empire State, Parks and Trails New York/The Political and Economic Research Institute of the University of Massachusetts	Information about visitors to Niagara Frontier area state parks.	Throughout the document, but primarily in Sections 2 and 3.
The American Society of Civil Engineers Standard 7-02, Minimum Design Loads for Buildings and Other Structures and “Wind Zones in the United States” map	Map used to determine which wind region the County is in; this informed the wind hazard profile.	Throughout the document, but primarily in Sections 2 and 3.
New York City Area Consortium for Earthquake Loss Mitigation website	Historic event information	Throughout the document, but primarily in Sections 2 and 3.
FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room for your Home or Small Business	Typical damage for each Enhanced Fujita scale tornado and hurricane category, as well as wind zones and tornado activity maps	Throughout the document, but primarily in Sections 2 and 3.
FEMA NFIP Community Status Book	NFIP participating communities, numbers of policies, historic numbers and values of paid claims, etc.	Throughout the document, but primarily in Sections 2

Table 1.8
Review and Incorporation of Data from Outside Sources

Data Source	How Incorporated	Where Incorporated
		and 3.
FEMA data for NFIP Repetitive Loss Properties and Community Rating System communities	Repetitive Loss Data includes numbers of losses, value of paid claims, communities with repetitive loss properties, communities participating in the CRS (and CRS class), etc.	Throughout the document, but primarily in Sections 2 and 3.
FEMA's "NFIP Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials (FEMA-480)"	Types of mitigation measures, definitions of the different categories of flooding for the hazard profile, and a table showing the odds of being flooded (for various time periods and flood events)	Throughout the document, but primarily in Sections 2 and 3.
USGS Landslide Overview Map of the Conterminous United States, prepared in hard copy format in 1982 by Dorothy H. Radbruch-Hall, Roger B. Colton, William E. Davies, Ivo Lucchitta, Betty A. Skipp, and David J. Varnes (Geologic Survey Professional Paper 1183), compiled digitally by Jonathan W. Godt (USGS Open File Report 97-289), as viewed on NationalAtlas.gov	Landslide incidence and susceptibility	Throughout the document, but primarily in Sections 2 and 3.
American Society of Civil Engineers (ASCE) Standard 7-98: Minimum Design Loads for Buildings and Other Structures	Minimum design loads for wind	Throughout the document, but primarily in Sections 2 and 3.
FEMA's "Multi-Hazard Identification and Risk Assessment" (1997)	Several hazard definitions and information to support the hazard profile, as well as ideas for types of mitigation approaches	Throughout the document, but primarily in Sections 2 and 3.
American Meteorological Society "Glossary of Meteorology"	Definitions of meteorological hazards	Throughout the document, but primarily in Sections 2 and 3.
In addition, to conduct their Capability Assessments, local jurisdictions considered relevant plans, codes, and ordinances currently in place such as building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, site plan review requirements, growth management ordinances, comprehensive plans, capital improvements plans, economic development plans, emergency response plans, post-disaster recovery plans, post-disaster recovery ordinances, local waterfront revitalization plans (in seven of Erie County's communities), and real estate disclosure ordinances. For additional information, please see the "Capabilities and Resources" section of this plan.	Responses were recorded in the Capability Assessment of Section 4. At the Mitigation Strategy Working Session, jurisdictions were asked to review local plans and ordinances and consider all local capabilities when developing their mitigation strategies as the enhancement of existing capabilities, or bridging identified gaps in capabilities, can further mitigation goals and objectives.	Throughout the document, but primarily in Sections 2 and 3.

Regulatory Compliance

This Hazard Mitigation Plan was prepared in a manner consistent with applicable regulations, criteria, and guidance. The Plan's components address the local hazard mitigation planning requirements of the DMA 2000. The Planning Group used FEMA's Multi-Hazard Mitigation Planning Guidance document of March 2004 (Revised July 2008) as a guide. This document contains what is known as a Crosswalk Reference Document for FEMA reviewers to track where in a document various criteria are addressed. Each criteria must be addressed satisfactorily for a plan to be approved by FEMA. There are three exceptions, with regard to assessing vulnerability. They are:

- Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A)
- Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)
- Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)

For these three criteria, highlighted in gray in **Table 1.9**, actions are strongly encouraged by FEMA, though not required by the DMA 2000 Interim Final Rule. While FEMA encourages communities to address such criteria, they are not required for Plan approval. For the Erie County Multi-Jurisdictional Hazard Mitigation Plan, these three criteria were addressed to the greatest extent practicable in the time available and using the best readily-available data. The following table summarizes specific requirements in the Interim Final Rule, and whether the regulation implementing DMA 2000 is addressed in this plan. Information in this plan is presented in the order of the plan review criteria for NYSEMO/FEMA reviewer's ease in evaluating compliance.

Table 1.9 FEMA Plan Review Criteria	
FEMA Plan Review Criteria	Addressed in Plan Update
Prerequisites Adoption by the Local Governing Body: §201.6(c)(5) Multi-Jurisdictional Plan Adoption: §201.6(c)(5) Multi-Jurisdictional Planning Participation: §201.6(a)(3)	Placeholder following page i Placeholder following page i Section 1, Apdx F
Planning Process Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)	Section 1 and Apdx. A
Risk Assessment Identifying Hazards: §201.6(c)(2)(i) Profiling Hazards: §201.6(c)(2)(i)	Section 2 Section 3
Assessing Vulnerability: Overview: §201.6(c)(2)(ii) Assessing Vulnerability: Addressing Repetitive Loss Properties: §201.6(c)(2)(ii)	Section 3 and Apdx. A-C Section 3
Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A) Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B) Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)	Section 3 and Apdx. C Section 3 Section 3
Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii)	Section 3
Mitigation Strategy Local Hazard Mitigation Goals: §201.6(c)(3)(i) Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii) Identification and Analysis of Mitigation Actions: NFIP Compliance: §201.6(c)(3)(iii) Implementation of Mitigation Actions: §201.6(c)(3)(iii) Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)	Section 5 Sections 6 - 7 and Apdx. D Sections 6 - 7 and Apdx. D Section 8 and Apdx. E Section 8 and Apdx. E
Plan Maintenance Process Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i) Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii) Continued Public Involvement: §201.6(c)(4)(iii)	Section 9 Section 9 Section 9

It is important to note that during the plan update process, FEMA issued new guidance for hazard mitigation plans – the Local Mitigation Plan Review Guide (October 1, 2011). The target audience for

this Guide is Federal and state officials that complete local mitigation plan reviews. The revised Local Mitigation Plan Review Guide is available for any State to use as of October 1, 2011. Implementation will be phased over the course of a year and the Local Mitigation Plan Review Guide will become effective on October 1, 2012. FEMA is directing plan developers to a Local Mitigation Planning Handbook, currently under development (expected for release in FY 2012).

The Guide contains several significant changes from the current local mitigation planning guidance:

- Stronger emphasis on the Mitigation Strategy and Implementation;
- Simplified to describe only the regulatory requirements;
- New Guiding Principles and Intent statements support regulatory requirements; and
- New Plan Review Tool to replace the existing Crosswalk in a simplified format and communicate implementation of the plan as well as improvements to the plan.

While the guidance itself is changing, the basic requirements (DMA 2000) remain the same.

Consultants considered the Guide during this plan update. However, based on the project schedule, this first plan update will be reviewed by FEMA prior to October 2012 and therefore, plan authors expect that this first plan update will ultimately be reviewed according to the 2008 Guidance (Blue Book).

Document Organization

This Multi-Jurisdictional Hazard Mitigation Plan for Erie County is organized into the following sections.

Section 1 - Introduction. Plan purpose, overview of Erie County, summary of plan development process, document organization, and key terms.

Section 2 - Identification of Potential Hazards. Documentation of the Planning Committee's evaluation of a full range of natural hazards, and indication of which hazards were identified for inclusion in this plan (and why) versus those that were not identified (and why not).

Section 3 - Risk Assessment. Hazard profiles, identification and characterization of assets in hazard areas, damage estimates, and summary of land uses and development trends in hazard areas.

Section 4 - Capabilities and Resources. Overview of local, state, and federal resources for hazard mitigation.

Section 5 - Mitigation Goals. Summary of hazard mitigation goals for the State Hazard Mitigation Plan and also for this county-wide multi-jurisdictional hazard mitigation plan.

Section 6 - Range of Alternative Mitigation Actions Considered. Summary of mitigation actions considered by participating jurisdictions.

Section 7 - Action Item Evaluation and Prioritization. Information regarding the methodology and process followed by participating jurisdictions to evaluate and prioritize unique hazard mitigation actions for their communities.

Section 8 - Implementation Strategy. Summary of hazard mitigation actions selected by each participating jurisdiction.

Section 9 - Plan Maintenance. Procedures selected for monitoring, evaluating, and updating this mitigation plan; including participation of the public and other stakeholders in plan maintenance, and plan integration.

Key Terms

For the purpose of clarity throughout this document, the following definitions are briefly outlined:

- **Hazard mitigation** is the method by which measures are taken to reduce, eliminate, avoid or redirect natural hazards in order to diminish or eradicate the long-term risks to human life and property.
- A **natural hazard** is any hazard that occurs or results from acts of nature such as floods, earthquakes, hurricanes, tornadoes and coastal storms, to name a few.
- A hazard mitigation plan is a well-organized and well-documented evaluation of the natural hazards and the extent that the events will occur. In addition, the plan identifies the vulnerability to the effects of the natural hazards typically present in a certain area, as well as the goals, objectives and actions required for minimizing future loss of life and property damage as a result of natural hazards.
- **Hazard mitigation planning** is the process of managing actions taken by individual citizens and professional organizations involved in mitigation activities. The process involves carrying out plans to reduce loss of life, injuries and damage to property, as well as reducing the costs associated with losses from natural hazards. It is a long-term process with benefits best realized over time.
- A **disaster** is any catastrophic event that causes loss of life, injuries and widespread destruction to property. For the purpose of this document, a disaster is the result of a natural hazard, whether anticipated (such as flash flood warnings) or fortuitous (such as earthquakes).
- The term **human-caused hazards** refers to technological hazards + terrorism, where “technological hazards” are incidents that arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials, where the incidents are accidental and their consequences unintended; and “terrorism” is the intentional, criminal, and/or malicious acts resulting from the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; and cyberterrorism.

Overview of Modifications to the Document since the Previous Version - 2005

This section is intended to document how the planning team reviewed and analyzed each section of the prior version of the plan (2005) and whether each section was revised as part of the update process.

A **major rewrite of the 2005 Plan** was undertaken by the consultant during this first plan update. Consultants have reviewed the 2005 Plan, as well as FEMA’s recommended revision from their 2005 review of the document. A conference call was held between the consultant, ECDES, NYSOEM, and FEMA to quantify FEMA’s expectations for the most critical improvements to be addressed during the plan update process. It was the consultant’s opinion that the 2005 Plan would not be deemed to meet FEMA’s requirements in the absence of a major rewrite.

The document has been reorganized, expanded, and largely rewritten, to more comprehensively address the FEMA requirements and present information in a manner that mirrors the flow of the FEMA Local Mitigation Plan Review Requirements (“Crosswalk”). This has an added benefit for the County and its participating jurisdictions not only for its implementation and updates over the next plan maintenance

cycles, but also to ensure that it is easy for the FEMA reviewers to identify where, specifically, each plan requirement is addressed. Applicable and relevant information from the last version of the plan has been carried through to the updated text on a case by case basis. Many of FEMA's recommended revisions from their review of the 2005 Plan have also been addressed in this update.

Every section of the 2005 Plan has been reviewed and comprehensively updated as needed to achieve compliance with FEMA mitigation planning requirements outlined in the *Local Multi-Hazard Mitigation Planning Guidance* ("Blue Book") of July 2008 – released several years after the last plan was approved.

Highlights of some key additional information appearing in this updated document include:

- A description of the planning process and associated outreach activities (to the public and other stakeholders) that was undertaken as part of this update.
- Historical occurrences of the identified hazards since the last version of the plan was prepared (including but not limited to major disaster and emergency declarations).
- Current information regarding changes in development, progress on local mitigation efforts, and any changes in priorities.
- The status of past projects and plan maintenance activities, as well as identification of new mitigation strategies, for the County and each of the 42 municipalities who participated in the plan update.
- A full summary of local capabilities.
- Incorporation of published information not available at the time of the 2005 Plan (including, *but not limited to*: the New York State Hazard Mitigation Plan of 2008, the Erie-Niagara Framework for Regional Growth of 2006, and County and municipal HAZNY's of 2010).

Furthermore, on October 11, 2011, FEMA released its *Local Mitigation Plan Review Guide*. A companion *Local Mitigation Planning Handbook* was released in March 2013, while the plan was under agency review. The *Plan Review Guide* and the *Planning Handbook* have superseded the *Local Multi-Hazard Mitigation Planning Guidance* that was in effect when the plan update process began in the summer of 2011. While FEMA did not review the plan according to the newest requirement, this plan update has been authored with an eye toward these changing in review requirements. **Table 1.10** documents how each section of the plan was reviewed and analyzed, and whether each section was revised as part of the update process.

Table 1.10
Overall Summary of Plan Transition – 2005 to 2015

2005 Plan Section (s)	2015 Plan Update Section(s)	Comments
Section 1 – Executive Summary	Executive Summary	Consultant reviewed and analyzed the 2005 Section 1 - Executive Summary against the FEMA Blue Book. It was determined that the 2014 Plan Update would more appropriately be structured such that the Executive Summary would appear preceding plan sections. A new Executive Summary appears in the 2014 Plan Update. Much of the information in the old Executive Summary was retained. Text was also expanded/reworded.

Table 1.10
Overall Summary of Plan Transition – 2005 to 2015

2005 Plan Section (s)	2015 Plan Update Section(s)	Comments
Section 2 – Overview of Erie County and Section 3 – Planning Process	Section 1 – Introduction	Consultant reviewed and analyzed the 2005 Section 2 – Overview of Erie County and Section 3 – Planning Process against the FEMA Blue Book. The 2005 Section 2 was expanded and updated, and moved into the 2014 Section 1. The 2005 Section 3 was updated to reflect the new planning process, and moved into the 2014 Section 1. The 2014 Section 1 was also expanded to include information not directly part of the 2005 Plan, including: Regulatory Compliance, Document Organization, and Key Terms, and Overview of Modifications to the Document since the Previous Version. The 2005 Plan Development Meeting Summary was moved to the 2014 Appendix H, following plan update meeting presentation and attendance information.
Section 4 – Risk Assessment	Section 2 – Hazard Identification Section 3 – Risk Assessment Section 4 – Capabilities and Resources	<p>Consultant reviewed and analyzed the 2005 Section 4 against the FEMA Blue Book. The 2005 text could be characterized as an expanded version of the HAZNY analysis. It was rewritten in its entirety, and broken out into two sections, as follows.</p> <p>A new plan section was written (2014 Section 2) to focus solely on the hazard identification step. The 2014 text is written to include a full list of hazards considered, and to document the 2005 assessment versus the 2014 assessment of why each was included (or excluded) from the 2014 Plan. It also incorporated information in the County 2010 HAZNY.</p> <p>The 2014 Plan Section 3a was written to profile each identified hazard. The 2014 Update is a rewrite of the 2005 text, but did incorporated some information from the 2005 Plan, as applicable. It also incorporated information in the County 2010 HAZNY.</p> <p>The 2014 Plan Section 3b was written to present a new, detailed identification and characterization of assets in hazard areas, not previously part of the 2005 Plan. The 2005 Plan did include a map of critical facilities; however, it was deemed more valuable to provide the county and its jurisdictions with a list of specific facilities tallied against their presence in the various hazard areas, to give participants a better understanding of their vulnerabilities (it is not particularly useful to know where the facilities exist, or that they are present, unless that information is paired with information regarding what hazards those facilities could be exposed to).</p> <p>The 2014 Plan Section 3c was written to present a new, detailed estimate of estimated average annual damages for each hazard, not previously part of the 2005 Plan. The 2005 Plan did include exposure information county-wide, and within the flood hazard area. These analyses were redone to incorporate updated parcel information, new FEMA DFIRMs, and an expanded list of hazards, for not only exposure but also estimates of potential damages, by municipality.</p> <p>The 2014 Plan Section 3d was written to present a new, detailed summary of land uses and development trends in hazard areas, not previously part of the 2005 Plan.</p> <p>The 2005 Plan's Section 4 Page 57 included a link to an abbreviated, County level Capability Assessment. As part of the 2014 Plan Update Erie County conducted a full Capability Assessment. Unlike the 2005 Plan, each municipality conducted a full Capability Assessment as well. Results of these local capabilities are presented in the 2014 Plan's Section 4, along with detailed information regarding State and Federal Capabilities, which also were not part of the 2005 Plan.</p>

Table 1.10
Overall Summary of Plan Transition – 2005 to 2015

2005 Plan Section (s)	2015 Plan Update Section(s)	Comments
Section 5 – Mitigation Strategy	Section 5 – Mitigation Goals Section 6 – Range of Alternative Mitigation Actions Considered Section 7 – Action Item Evaluation and Prioritization Section 8 – Implementation Strategy Appendices D, E, F and N	<p>The 2005 Plan’s Section 5 Mitigation Strategy underwent a major rewrite and was split into three sections in the 2014 Plan Update to more closely document how the plan update process aligns with each step of FEMA’s requirements.</p> <p>Section 5 lists the plan goals (in parallel with goals of the State plan); Section 6 describes a range of alternative mitigation actions considered for each hazard; 7 describes the process of action item evaluation and prioritization. Appendix D presents municipal documentation of the prioritization step; Appendix E presents municipal documentation of implementation strategy development; and Appendix F documents how each community met the requirements of the 2008 guidance with regard to continued compliance with the NFIP. Finally, Appendix N presents documentation associated with the update, showing the status of all projects identified for implementation in the 2005 plan.</p>
Section 6 – Plan Maintenance	Section 9 – Plan Maintenance	The 2005 Plan’s Section 6 was rewritten, expanded, and reorganized to more closely align with the FEMA requirements. Subsections now include detailed plans for: monitoring the plan, evaluating the plan, updating the plan, public participation in plan maintenance, and plan integration.
Section 7 – Supporting Maps and Documents	Various	Incorporated throughout as deemed applicable and directly beneficial to the plan.
Section 8 – Annex	Not directly incorporated	Information/plans contained in Annex’s A through J as previously part of the 2005 Plan was deemed applicable for direct inclusion in their entirety in the hazard mitigation plan.
Section 9 – Information Sources/Bibliography	Section 1 (beginning on Page 1-41)	Updated to reflect data sources evaluated as part of the 2014 Plan Update.

SECTION 2 - IDENTIFICATION OF POTENTIAL HAZARDS

After consideration of a full range of potential hazards, several hazards have been identified as significant hazards of concern to be addressed in this Hazard Mitigation Plan. FEMA's current regulations and interim guidance require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of "human-caused" hazards (i.e., technological hazards and/or terrorism) is encouraged, though not required, for plan approval under DMA 2000. Erie County has chosen address both natural and human-caused hazards in this plan. Hazards were identified through an extensive process that utilized direct input from Mitigation Planning Committee members, research of past disaster declarations in the County, and review of the New York State Hazard Mitigation Plan, and existing County and municipal HAZNY studies. HAZNY (Hazards New York) is an automated hazard analysis program which asks questions concerning hazards faced by a community and, rates and ranks each hazard based upon the responses. Readily available online information from reputable sources (such as Federal and state agencies) was also evaluated to supplement information from these key sources. The most prominent online sources of data used in this assessment to identify the occurrence of various hazards were records of declared disasters and emergencies maintained by FEMA and NYSOEM, the National Climatic Data Center (NCDC) Storm Event Database, and the Spatial Hazard Events and Losses Database for the United States (SHELDUS) maintained by the Hazards and Vulnerability Research Institute at the University of South Carolina.

The following table (**Table 2.1**) presents the full range of hazards considered and provides a brief description of each hazard. Subsequently, **Table 2.2** documents the evaluation process for the hazards listed in **Table 2.1** to determine the hazards worthy of further consideration in the plan. For each hazard considered, **Table 2.2** indicates whether or not the hazard was identified as a significant hazard to be addressed in the plan, how this determination was made (i.e., the sources of information that were consulted while researching each hazard) and why this determination was made. The table summarizes not only those hazards that *were* identified (and why) but also those that *were not* identified as a significant hazard (and why not).

Some of these hazards are considered to be interrelated or cascading (i.e., hurricanes can cause wind damage and flooding), but for preliminary hazard identification purposes these individual hazards have been broken out separately. It should also be noted that some hazards, such as earthquakes or winter storms may impact a large area yet cause little damage, while other hazards, such as a tornado, may impact a small area yet cause extensive damage within that area.

Because this Hazard Mitigation Plan is a living document, hazard events not identified for inclusion and profiling at this time could be addressed during future evaluations and updates of the plan if deemed necessary by the Mitigation Planning Committee at that time.

Table 2.3 provides a summary checklist of the hazard identification and evaluation process noting which of the initially identified hazards are considered significant enough for further evaluation through the risk assessment (marked with a "☑").

Table 2.4 provides a summary of the results of the County's most recent HAZNY analysis for reference and comparison. Note that the updated plan's risk assessment will include all natural hazards ranked above "low" in the 2010 HAZNY analysis.

For any man-made hazards of concern identified in this section, additional information can be found in Appendix J. *Note: Appendix J includes sensitive information and is not intended for public release.*

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.1
Descriptions of the Full Range of Initially Considered Hazards

Hazard	Description
ATMOSPHERIC	
Avalanche	A rapid fall or slide of a large mass of snow down a mountainside.
Extreme Temperatures	Extreme heat and extreme cold constitute different conditions in different parts of the country. Extreme cold can range from near freezing in the South to temperatures well below zero in the North. Similarly, extreme heat is typically recognized as the condition whereby temperatures hover ten degrees or more above the average high temperature for a region for an extended period.
Extreme Wind	Wind is air that is in constant motion relative to the surface of the earth. Extreme wind events can occur suddenly without warning. They can occur at any time of the day or night, in any part of the country. Extreme winds pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris and can down trees and power lines. Extreme winds are most commonly the result of hurricanes, tropical storms, nor'easters, severe thunderstorms and tornadoes, but can also occur in their absence as mere "windstorms." One type of windstorm, the downburst, can cause damage equivalent to a strong tornado.
Hailstorm	Any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. Hail is formed when updrafts in thunderstorms carry raindrops in to parts of the atmosphere where the temperatures are below freezing.
Hurricane and Tropical Storm	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter averaging 10 to 30 miles across. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea and Gulf of Mexico during the official Atlantic hurricane season, which extends from June through November.
Lightning	Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 73 people are killed each year by lightning strikes in the United States.
Nor'easter	Similar to hurricanes, nor'easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their associated strong winds and heavy surf. Nor'easters are named for the winds that blow in from the northeast and drive the storm up the East Coast along the Gulf Stream, a band of warm water that lies off the Atlantic coast. They are caused by the interaction of the jet stream with horizontal temperature gradients and generally occur during the fall and winter months when moisture and cold air are plentiful. Nor'easters are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surf that causes severe beach erosion and coastal flooding.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size and duration of the storm.
Winter Storm	Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.1
Descriptions of the Full Range of Initially Considered Hazards

Hazard	Description
HYDROLOGIC	
Coastal Erosion	Landward displacement of a shoreline caused by the forces of waves and currents. Coastal erosion is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. It is generally associated with episodic events such as hurricanes and tropical storms, nor'easters, storm surge and coastal flooding but may also be caused by human activities that alter sediment transport. Construction of shoreline protection structures can mitigate the hazard, but may also exacerbate it under some circumstances.
Dam Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam. Dam failure can result from natural events, human-induced events, or a combination of the two. The most common cause of dam failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes or landslides are significant because there is generally little or no advance warning.
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities.
Flood	The accumulation of water within a water body which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, or shallow flooding (where shallow flooding refers to sheet flow, ponding and urban drainage).
Ice Jams	A formation of ice over a body of water that limits the flow of the water due to freezing. Ice jam flooding occurs when warm temperatures and heavy rain cause the snow to melt rapidly, causing frozen rivers or lakes to overflow. As the water lifts, the ice that's formed on top of the body of water breaks into small pieces of varying sizes. These pieces or large chunks of ice tend to float downstream and often pile up near narrow passages or near obstructions, such as bridges and dams. This accumulation can impact the integrity of the structures and also cause upstream flooding as water backs up behind the obstruction.
Seiche	A seiche is a standing wave that oscillates in a lake as a result of seismic or atmospheric disturbances creating huge fluctuations of water levels in just moments. Most seiches on the Great Lakes are results of surges combined with a dramatic and sudden drop in atmospheric pressure or wind speed.
Storm Surge	Great Lakes storm surges are temporary rises in water level caused by storm winds blowing across miles of open water and dragging some water towards the down-wind shore. This causes a build-up in water level along the down-wind shore. Surges typically last about as long as the strong winds are blowing onshore. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. Further, water rise caused by storm surge can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas.
Wave Action	The characteristics and effects of waves that move inland from an ocean, bay, or other large body of water. Large, fast moving waves can cause extreme erosion and scour and their impact on buildings can cause severe damage. During hurricanes and other high-wind events, storm surge and wind increase the destructiveness of waves and cause them to reach higher elevations and penetrate further inland.
GEOLOGIC	
Earthquake	A sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the surface. This movement forces the gradual building and accumulation of energy. Eventually, strain becomes so great that the energy is abruptly released, causing the shaking at the earth's surface which we know as an earthquake. Roughly 90 percent of all earthquakes occur at the boundaries where plates meet, although it is possible for earthquakes to occur entirely within plates. Earthquakes can affect hundreds of thousands of square miles; cause damage to property measured in the tens of billions of dollars; result in loss of life and injury to hundreds of thousands of persons; and disrupt the social and economic functioning of the affected area.

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.1
Descriptions of the Full Range of Initially Considered Hazards

Hazard	Description
Expansive Soils	Soils that will exhibit some degree of volume change with variations in moisture conditions. The most important properties affecting degree of volume change in a soil are clay mineralogy and the aqueous environment. Expansive soils will exhibit expansion caused by the intake of water and, conversely, will exhibit contraction when moisture is removed by drying. Generally speaking, they often appear sticky when wet, and are characterized by surface cracks when dry. Expansive soils become a problem when structures are built upon them without taking proper design precautions into account with regard to soil type. Cracking in walls and floors can be minor, or can be severe enough for the home to be structurally unsafe.
Landslide	The movement of a mass of rock, debris, or earth, down a slope when the force of gravity pulling down the slope exceeds the strength of the earth materials that comprise to hold it in place. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high.
Land Subsidence	The gradual settling or sudden sinking of the Earth's surface due to the subsurface movement of earth materials. Causes of land subsidence include groundwater pumpage, aquifer system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost.
Tsunami	A series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Tsunamis differ from regular ocean waves in that their currents travel from the water surface all the way down to the sea floor. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively "pile up", and wave heights to increase dramatically. As opposed to typical waves which crash at the shoreline, tsunamis bring with them a continuously flowing 'wall of water' with the potential to cause devastating damage in coastal areas located immediately along the shore.
Volcano	A mountain that opens downward to a reservoir of molten rock below the surface of the earth. While most mountains are created by forces pushing up the earth from below, volcanoes are different in that they are built up over time by an accumulation of their own eruptive products: lava, ash flows, and airborne ash and dust. Volcanoes erupt when pressure from gases and the molten rock beneath becomes strong enough to cause an explosion.
OTHER	
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.
MAN-MADE HAZARDS	
Air Contamination	The introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment or built environment, into the atmosphere.
Civil Unrest	A broad term that is typically used by law enforcement to describe one or more forms of disturbance caused by a group of people. Civil disturbance is typically a symptom of, and a form of protest against, major socio-political problems; the severity of the action coincides with public expression(s) of displeasure.
Epidemic	When new cases of a certain disease, in a given human population, and during a given period, substantially exceed what is expected based on recent experience.
Explosion	A rapid increase in volume and release of energy in an extreme manner, usually with the generation of high temperatures and the release of gases.
Fire	The rapid oxidation of a material in the chemical process of combustion, releasing heat, light, and various reaction products.

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.1
Descriptions of the Full Range of Initially Considered Hazards

Hazard	Description
Food Shortage	A widespread scarcity of food, caused by several factors including crop failure, overpopulation, or government policies. This phenomenon is usually accompanied or followed by regional malnutrition, starvation, epidemic, and increased mortality.
Fuel Shortage	A widespread scarcity of fuel, caused by several factors including limited supplies, production issues, various problems in the energy sector, or government policies.
Hazardous Materials	Solids, liquids, or gases that can harm people, other living organisms, property, or the environment. They are often subject to chemical regulations and can include materials that are radioactive, flammable, explosive, corrosive, oxidizing, asphyxiating, biohazardous, toxic, pathogenic, or allergenic. Also included are physical conditions such as compressed gases and liquids or hot materials, including all goods containing such materials or chemicals, or may have other characteristics that render them hazardous in specific circumstances.
Infestation	The state of being invaded or overrun by pests or parasites. In general, the term "infestation" refers to parasitic diseases caused by animals such as arthropods (i.e. mites and ticks), lice, and worms but excluding those caused by protozoa, fungi, and bacteria.
Mine Collapse	The collapse of a man-made, underground cavern created during the process of extraction of mineral resources from the ground.
Oil Spill	The release of a liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity, and is a form of pollution. The term is mostly used to describe marine oil spills, where oil is released into the ocean or coastal waters. Oil spills may be due to releases of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products (such as gasoline, diesel) and their by-products, heavier fuels used by large ships such as bunker fuel, or the spill of any oily refuse or waste oil.
Radiological	The release of radioactive substances onto surfaces, or within solids, liquids or gases (including the human body), where their presence is unintended or undesirable. Causes are typically the result of a spill or accident during the production or use of radionuclides (radioisotopes), and less typically, by a nuclear explosion.
Structural Collapse	The immediate or progressive collapse of a structure due to the loss of the load-carrying capacity of a component or member within a structure or of the structure itself, initiated when the material is stressed to its strength limit, thus causing fracture or excessive deformations that exceed the system's design.
Terrorism	The systematic use of terror, especially as a means of coercion. Common definitions of terrorism refer to those violent acts which are intended to create fear (terror), are perpetrated for a religious, political or, ideological goal; and deliberately target or disregard the safety of non-combatants (civilians).
Transportation Accidents	Any accident that occurs during transportation. Specifically, it can refer to: an aviation accident and incident; a sailing ship accident; a train wreck; or a vehicle collision.
Utility Failure	The failure of electrical power, mechanical, gas, water or sewer systems.
Water Supply Contamination	The introduction of harmful compounds into a water supply, either accidental or intentional.

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
ATMOSPHERIC HAZARDS					
Avalanche	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of US Forest Service National Avalanche Center web site Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County Hazards New York assessments (HAZNYs) Review of the Spatial Hazard Events and Losses Database for the United States (SHELDUS) Planning team feedback 	<ul style="list-style-type: none"> Avalanches are not included in the NY State Hazard Mitigation Plan, and are not discussed for NY on the US Forest Service Avalanche Center web site. While avalanches are not unknown in northern New York State, the topography in Erie County does not support conditions required for the occurrence of significant avalanches. Avalanches were not included in the Erie County HAZNY study of 2005. The lack of historic event information in Erie County would indicate a low risk. The American Avalanche Association reports only one avalanche-related fatality in New York State in the last decade (02/19/00 in the Adirondack High Peaks, well away from Erie County). While the NYSDEC has issued guidance regarding avalanche risks in the Adirondack Mountains, no such guidance has been issued for locations in the remainder of the state. The SHELDUS database reports no historic occurrences of avalanches in Erie County. 	No
Extreme Temperatures	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database Review of the Spatial Hazard Events and Losses Database for the United States (SHELDUS) Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Extreme temperatures are discussed in the State Plan. Extreme heat is included as a discrete hazard, while extreme cold is discussed in the context of winter storms. The state plan shows that the percentage of the population in 2006 most susceptible to extreme temperatures (those under 5yrs and over 65yrs) is 20.9%, which is slightly higher than the statewide average of 19.5%. NCDC reports three extreme temperature events for areas including Erie County between February 1993 and November 2011 (including two extreme heat events and one extreme winter cold events). For these events \$50,000 in recorded property damages was recorded, with no attributed fatalities, injuries or crop damages across the County. The SHELDUS database does not report any additional extreme temperature events affecting Erie County. The Erie County HAZNY ranked extreme temperatures as a Moderately Low Hazard: the 10th most significant natural hazard in the County out of 12 included in the assessment. 	YES

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Extreme Wind	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of NOAA NCDC Storm Events Database Review of SHELUDS database Review of American Society of Civil Engineers (ASCE) Standard 7-02 (Minimum Design Loads for Buildings and Other Structures) Review of Wind Zones in the United States as per FEMA Publication 320 – Taking Shelter From the Storm Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Extreme wind events are included in the NY State plan in the context of hurricane and tornado events. The state plan ranks Erie County as 5th out of 62 counties in the state for the threat of extreme wind and vulnerability to extreme wind losses. Erie County is located in a climate region that is highly susceptible to numerous types of extreme wind events such as straight line winds, severe thunderstorms. According to FEMA-320 Figure I-4, Erie County is located in a wind zone where extreme wind speeds of 200 mph are possible. NCDC reports 56 high wind events (wind speed > 50 knots/58 mph) affecting Erie County since 1993, causing three deaths, 22 injuries and approximately \$31 million in property damage and \$200,000 in crop damage across the region including Erie County. NCDC also records more than 230 significant thunderstorm wind events in the County since 1956, including 125 events since 1993 which have caused 12 injuries and nearly \$3 million dollars in damages. The SHELUDS database records nearly 550 high wind/severe storm events in Erie County since 1960, with approximately \$45 million in attributed damages. The 3 second wind gust for Erie County for building design purposes as per ASCE 7-02 is 90 mph. The standard also shows that Erie County is located outside of mapped Special Wind Regions, i.e., areas where wind anomalies are known to occur and in which wind speeds may be substantially higher than specified. The Erie County HAZNY ranked severe storms (including windstorms) as a Moderately High Hazard: the 3rd most significant natural hazard in the County out of 12 included in the assessment. 	YES

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Hailstorm	Not considered as a separate hazard, but mentioned as part of severe storms, which was identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update. Hailstorms will not be evaluated as a stand-alone hazard for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of NOAA NCDC Storm Events Database Review of SHELDUS database NOAA National Severe Storms Laboratory (NSSL) website National Agricultural Statistics Service website Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Hail is not one of the hazards included in the HAZNY Hail is not listed as a significant potential hazard in the Erie County Comprehensive Emergency Management Plan While the state plan includes hailstorms as a discrete hazard, and NCDC reports 89 hailstorm events (3/4 inch diameter hail or greater) for Erie County between 1959 and 2011, "damaging" hail (of at least 2 inches in diameter) was not reported in Erie County for any of these events. According to NSSL mapping, Erie County is located in a region with the lowest annual number of days with hailstorms (less than 2), and where the annual average number of damaging hail events is essentially zero. Hailstorms in Erie County are not particularly likely, or likely to be particularly intense. There are minimal hazard mitigation techniques available to reduce hailstorm impacts to property, outside of basic building codes and the emergency preparedness procedures and severe weather warning systems already in place (i.e., mass public notifications that recommend immediate protective actions such as moving automobiles into protected spaces). <p>Agricultural losses during a significant hail event have the potential to be significant; however, there are no known hail mitigation measures for crops, which would be exposed to the greatest hail damages.</p>	NO

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Hurricane and Tropical Storm	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Analysis of NOAA historical tropical cyclone tracks Review of NOAA National Hurricane Center (NHC) website Review of NOAA NCDC Storm Events Database Review of SHEL DUS database Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Hurricane and tropical storm events are discussed in the state plan, which includes FEMA mapping showing Erie County located outside of mapped hurricane-susceptible areas. NYSEMO records show that Erie County has not been included in the area covered by major FEMA disaster declarations due to hurricanes or tropical storms. NOAA historical records indicate one hurricane track (an unnamed Category 1 storm in the year 1893) and two tropical depression tracks (remnants of Hurricane Dennis in 1999 and remnants of Hurricane Connie in 1955) passing within 65 nautical miles of Erie County between 1878 and the present. Records also indicated nine systems that were extra tropical in nature. The NCDC database does not record any hurricane or tropical storm events affecting Erie County. The SHEL DUS database reports that the remnants of Tropical Storm Brenda in 1960 (whose center was well east of Erie County, following a track along the US east coast) caused a very small amounts of damage (just over \$8,000) in total) in the County. Hurricanes and tropical storms are not listed as significant potential hazards in the Erie County Comprehensive Emergency Management Plan 	No

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Lightning	Not considered as a separate hazard, but mentioned as part of severe storms, which was identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update. Lightning will not be evaluated as a stand-alone hazard for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of NOAA NCDC Storm Events Database, NOAA lightning statistics, and NSSL web site Review of SHELDS database Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Lightning is not considered as a discrete hazard in the NY State Hazard Mitigation Plan or the County HAZNY study. Lightning is not listed as a significant potential hazard in the Erie County Comprehensive Emergency Management Plan While NOAA records that New York State has experienced the fourth most deaths and third most damages from lightning in the United States from 1959 to 1994, FEMA and NOAA data also shows that Erie County is located in an area of the country that experiences an average of only 30 to 40 thunder days annually, and one to four lightning flashes per square kilometer per year. For comparison, about half of the country experiences from 40 to more than 70 thunder days per year and twice as many flashes per square kilometer. NCDC reports only 10 significant lightning events for Erie County since May 1998 resulting in 6 injuries and a total of \$120,000 in property damages. Based on this report of historic occurrences, Erie County can expect an average of only 0.77 events per year, and average annual damages of approximately \$9,000 county-wide. The SHELDS database records 82 lightning events in Erie County between 1960 and 2005, causing 20 injuries, four fatalities, \$1.4 million in property damage, and nearly \$2,000 in crop damages. Roughly 60 percent of the incidents involved damages of more than \$1,000. Based on this report of historic occurrences, Erie County can expect an average of 1.82 events per year, and average annual damages of \$31,000 per year county-wide. Based on these reports of historic occurrences, while lightning can and does occur in Erie County, significant and damaging events are relatively infrequent (approximately 0.77 to 1.82 events per year) and causing relatively little damage on an average annual basis (between about \$9,000 and \$31,000 per year county-wide). This hazard therefore was not deemed to be significant enough to warrant inclusion in the plan at this time. 	NO

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Nor'easter	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> The NCDC and SHELDUS databases do not specifically list nor'easters as individual hazard events. Nor'easters are not listed as a significant potential hazard in the Erie County Comprehensive Emergency Management Plan Although the Erie County HAZNY study ranked "winter storms" as the most significant natural hazard in the county, the study did not consider nor'easters as a discrete hazard for individual assessment. Nor'easters are discussed in the state plan as a common cause of flooding and severe snowstorms in the southern and eastern portion of the state. Typically, nor'easters affect the New York City and Long Island region. On occasion, the storms are large enough to encompass most of the state. The impacts of nor'easters (high winds, flooding and heavy snow) are considered as individual hazards of concern to be addressed separately in this plan. 	NO
Tornado	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of NOAA NCDC Storm Events Database Review of NSSL website Review of SHELDUS database Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> The state plan reports that New York State has a definite vulnerability to tornadoes, with an average occurrence of approximately six tornadoes per year since 1952. The SHELDUS database records 13 damage-causing tornado events between 1957 and 2011, but does not record their magnitude. NCDC reports an additional five events for a total of 18 damage-causing tornado events in Erie County since 1957. Of the 18 recorded events, one was of magnitude F3 on the Fujita Scale (severe damage), four were of magnitude F2 (considerable damage), six were of magnitude F1 (moderate damage), and the remaining seven were F0 (light damage). Total property damage for all events in Erie County is approximately \$4.5 million. NSSL tornado probability data indicate that while Erie County is in an area that experiences only 0.2 to 0.4 tornado events per year, such events are likely to be life-threatening and cause significant damages when they occur. The Erie County HAZNY study ranked tornadoes as the 5th most significant natural hazard in the County. 	YES

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Winter Storm	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of NOAA NCDC Storm Events Database Review of SHELDS database New York State Climate Office web site Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Winter storms are discussed in the state plan, which ranks Erie County 1st out of 62 counties in the state for most threatened by snow and vulnerable to snow losses; and 19th out of 62 for most vulnerable to ice storms and ice storm losses. Average annual snowfall in Buffalo is 96.8 inches, substantially more than the statewide average of 65 inches. Locally higher amounts are observed in certain areas. NCDC reports that Erie County has been affected by 110 significant snow and ice events between 1993 and 2011. \$95 million in property damages have been attributed to these events (including some damages occurring outside of Erie County). The SHELDS database records a total of 265 winter-related events in Erie County, to which 12 injuries, 12 deaths, and more than \$55 million in damages are attributed. NCDC mapping shows Erie County to be located in an area with an average of 12 to 15 hours of freezing rain per year. According to NOAA, Erie County is located in an area where snow depths of between 75 and 125 inches have a 5% chance of being equaled or exceeded in any given year. Erie County has been included in four winter-related Federal disaster declarations and six emergency declarations. The Erie County HAZNY study ranked winter storms as the most significant natural hazard in the county, and ice storms in particular as the 4th most significant in the county. 	YES
HYDROLOGIC HAZARDS					
Coastal Erosion	Considered as part of wave action/seiche, which were identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update. However, the hazard will be evaluated as a stand-alone hazard for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment CEHA Mapping from NYSDEC Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> The Erie County HAZNY study did not include coastal erosion as a hazard for consideration. Erie County has three municipalities in the CEHA program and where coastal erosion is of significant concern: the Towns of Brant, Evans, and Hamburg. The program is administered locally in Hamburg, and administered by the State in Brant and Evans. CEHA mapping was provided by NYSDEC in .JPEG format; it is not yet available in GIS for detailed analysis. It shows the Natural Protective Feature in all cases, with no mapped Structural Hazard Areas. A comparison of these 1988 CEHAs versus 2008 aerials (as viewed on Google Earth) showed roughly 50 buildings may be intersected by the CEHA. Most are located in the Town of Evans. 	YES

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Dam Failure	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of NYSDEC Bureau of Flood Protection and Dam Safety web site Review of U.S. Army Corps of Engineers (USACE) National Inventory of Dams (NID) database Review of Stanford University's National Performance of Dams Program (NPDP) database Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Dam failure is briefly discussed in the state plan as a potential cause of flooding. Dam failure is not listed in the Erie County Comprehensive Emergency Management Plan as a significant potential hazard. According to US Geological Survey (USGS) criteria, there are no "Major" high hazard dams in the County, by virtue of having a dam height of 50 feet or more, or a normal storage volume of at least 5,000 acre-feet (out of a total of 293 dams county-wide). The Erie County HAZNY study ranked dam failure as a low hazard and the least significant natural hazard in the County, due to its occurring rarely and being unlikely to cause serious injury or death (only 3 of the 293 have the potential to cause loss of life in the event of failure or misoperation). The Stanford NPDP database records no dam incidents in the county since detailed records began in 1868. 	NO
Drought	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of NOAA NCDC Database Review of SHELDUS database Review of National Drought Mitigation Center and NOAA web sites Erie County HAZNYs Planning team feedback 	<p>Drought is discussed in the state plan. The Palmer Drought Severity Index (PDSI) map for the USA shows Erie County located in an area that experienced drought conditions ($PDSI \leq 3$, severe or extreme drought) for between 5 and 10 percent of the period 1895 to 1995. NCDC reports that Erie County has been affected by zero drought events since 1993, and the SHELDUS database reports the same. The County HAZNY study ranked drought as a low hazard (the 11th most significant natural hazard in the County out of 12 considered). Serious injury or death is unlikely, and expected damages to private and public facilities range from none to moderate. The County experiences a fairly humid, continental-type climate with a "maritime" flavor due to strong modification from the Great Lakes. Winters are generally cold and snowy. Summers are generally characterized by mild temperatures and moderate humidity. <i>While drought conditions in Erie County are indeed possible, they are not considered to be likely and are expected to result in little to no damage to private property or public facilities. Drought has not been deemed significant enough to present a sufficient level of danger to inclusion in the plan at this time.</i></p>	NO

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Flood (including storm induced rises and seiches)	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> • Review of NY State Hazard Mitigation Plan • Review of NOAA NCDC Storm Events Database • Review of SHELUS database • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of FEMA's National Flood Insurance Program (NFIP) Community Status Book and Community Rating System (CRS) status data • Review of FEMA flood data • Erie County HAZNYs • Planning team feedback 	<ul style="list-style-type: none"> • Flooding is described in the state plan as the primary natural hazard in the State of New York and is discussed in comprehensive detail. • Roughly two-thirds of all the Federal disaster declarations that affected Erie County have involved flooding. • Erie County has been affected by six flood-related Presidential disaster declarations since 1953, with the most recent due to severe storms and flooding in September 2009. • NCDC records 82 flood events affecting Erie County since August 1994. More than \$24 million in property damage and \$650 thousand in crop damage was attributed to these events, including damage occurring outside the County boundaries. The SHELUS database records an additional nine flood events which caused damage in Erie County between 1960 and the present. • According to data tabulated in the state plan, based on FEMA's Q3 flood mapping, 6.9 percent of Erie County land and 2.4 percent of all residential properties lie within the identified 100-year floodplain. The state plan ranks Erie County as the 3rd most threatened and vulnerable to flood loss out of the 62 counties in the state on this basis. • The state plan reports 10,197 residential properties in the 100-year floodplain in Erie County, with a total value of almost \$2 billion. Based on the number of residential properties so exposed, Erie County ranks 2nd in the State among those counties for which Q3 data is available, and 5th on the estimated value of exposed residential property. • All municipal jurisdictions in Erie County participate in the NFIP except for the Town and Village of North Collins. Two municipalities are eligible to participate in the CRS (the Town of Amherst and City of Lackawanna). According to data tabulated in the current New York State Hazard Mitigation Plan, Erie County ranks 5th out of 62 for the total number of NFIP policies, and 5th for the total dollar amount of NFIP coverage. The State Plan also ranks Erie County ranks 5th in the state for the total number of NFIP claims since 1978, and 10th for the total dollar amount of claims paid. 	YES

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
				<ul style="list-style-type: none"> The State Plan records include 2,532 individual NFIP paid flood loss claims totaling approximately \$9 million in Erie County between 1978 and 2007. The State Plan Appendix also reports that Erie County ranks 8th in the state for the number of repetitive loss properties. The Erie County HAZNY ranked flooding as the 9th most significant natural hazard in the County (moderately low), noting that is a regular event causing moderate damages to public and private property. Lake Erie wind tides, or “seiches” will be included as part of the flood hazard. Damaging seiches have occurred on Lake Erie in 2000, 2002, 2006, 2008, and 2009 for a total of \$210,000 in damages. 	
Ice Jams	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA’s Multi-Hazard Identification and Risk Assessment USACE Cold Regions Research & Engineering Laboratory (CRREL) Ice Jams Database Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Ice jams are mentioned as a significant cause of flooding in the state plan and New York State has, overall, experienced more ice jam events than any other U.S. state except Montana in the period 1867 through 2007. The Erie County HAZNY study ranked ice jams as a moderately low hazard, and one that represents the 8th most significant natural hazard in the County out of the 12 included in the study. They are noted to occur regularly, with cascade effects likely and cause moderate damage to public and private facilities. Ice jams occur regularly in Erie County. The USACE CRREL Ice Jams Database records 118 ice jam incidents in total on all watercourses in Erie County between 1929 and 2011. Sixty-four percent of these events have occurred on the Cayuga Creek and Cazenovia Creek alone. The 118 ice jam records in the CRREL database for Erie County do not include very detailed event information until about 1955. Prior to that year, event records are limited to general notes regarding discharges and gage heights. Beginning in 1955, record details begin to include qualitative assessments of impacts including overbank flooding, road closures, evacuations, etc. Dollar damages are listed as unknown for most event records, with the exception of nine events. Damages from these events alone total more than one million dollars. 	YES

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Storm Surge (Atlantic Coastal)	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of FEMA flood data Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Erie County is an inland county hundreds of miles away from Atlantic Coastal waters. Note that Lake Erie storm rises will be considered as part of the flood hazard. 	NO
Wave Action	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of FEMA flood data Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Waves are discussed in the state plan under the flood hazard; with particular note of storm induced wave action along Great Lakes Shorelines. Areas that are subject to significant wave action are designated as V (Velocity) Zones on FEMA/NFIP flood maps (areas along coasts subject to inundation by the 1-percent annual chance flood event with additional hazards associated with storm-induced waves with heights of three feet or more). FEMA's DFIRMs do not show any mapped V-zones in Erie County. The lack of mapped V-zones does not imply that wave action is not a hazard in Erie County along Lake Erie. Rather, it is indicative of the fact that this level of analysis is only deemed to be appropriate under certain conditions and with the approval of the Regional Project Officer for the study. FEMA's "Guidelines and Specifications for Flood Mapping Partners" (2002) indicates that the objective of FEMA coastal studies is to provide legible and accurate flood hazard maps with appropriate BFEs including wave contributions. However, it notes that because the typical study finding is a narrow V-Zone, its usefulness is uncertain on maps at usual scales and therefore, although procedures to define V-Zones are fully documented, both engineering and practical judgment are required to determine whether mapping V-Zones is appropriate. Also, FEMA estimates that relatively small numbers of existing coastal buildings are likely to be affected by possible V-Zone designations along some Great Lakes. The existence of mapped CEHAs in essence verifies the existence of the wave action hazard, as it is wave action that is working to erode the shoreline. 	YES

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
GEOLOGIC HAZARDS					
Earthquake	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of USGS Earthquake Hazards Program web site Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Earthquakes are discussed in the state plan, since earthquakes have occurred in and around the State of New York in the past. The state plan ranks Erie County 9th out of 62 counties for potential annualized earthquake losses (\$872,128). It notes that areas of northern Erie County would experience an amplification of ground motion during seismic activity according to the NEHRP soil classifications. According to USGS seismic hazard maps, the peak ground acceleration (PGA) with a 10% probability of exceedance in 50 years for Erie County is 3-4% of gravity. FEMA requires that earthquakes be further evaluated for mitigation purposes in areas with a PGA of 3% of gravity or more. USGS records do not show the occurrence of any earthquakes of magnitude 3.0 or greater centered in Erie County between 1698 and 1998. The New York State Plan reports an earthquake in Buffalo (Lockport) of magnitude 4.0 in 1857. Reported damages included the ringing of bells and items falling from shelves. Earthquakes of magnitude less than 3.0 are considered too small to be felt or to be the cause of damage. The Erie County HAZNY study ranked earthquakes as a moderately high hazard, and the 2nd most significant natural hazard in the County out of the 12 included in the study. 	YES
Expansive Soils	Identified as a significant hazard to be addressed in the plan at that time (though at the time, it was incorrectly termed 'subsidence').	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment US Department of Transport Federal Highway Administration (USDOT FHA) Geological Data Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Expansive soils are not identified as a hazard in the NY State plan. According to USDOT FHA Report No. FHWA-RD-76-82, Erie County lies in an area mapped as non-expansive – the occurrence of expansive materials is extremely limited. The Erie County HAZNY study did not include expansive soils as a hazard for consideration. The USACE's "Town of Amherst Soils and Residential Foundation Study" evaluated 1,095 reports of slight to severe foundation damage between 1987 and 2005. The majority of houses are located north of Main Street and within lacustrine soils. Lateral pressures and/or settlement are the principal causes of foundation damage. NO single causative factor accounts for the variety of damages that were observed. Expansive soils, compressible substrata, post-construction hydrologic modification, 	YES

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
				<p>marginally effective foundation design, poor construction, and inadequate observation/documentation are all identified as potential contributing factors at most sites. Foundation failure is a relatively common problem for residential structures built on expansive soils. Fine-grained lacustrine soils in Amherst have medium to high potential expansion. The current damage rate for houses on lacustrine soils is about three percent, but some affected neighborhoods report damage rates that are an order of magnitude greater. The average total repair cost as indicated from repair permits is about \$7,900, but the range is about \$500 to \$71,000. Stiff, fine-grained lacustrine foundation soils are expansive and may contribute to differential movements of the overlying house as laterally variable changes in foundation soil moisture content occur.</p> <ul style="list-style-type: none"> New York State building codes are based on the International Building Code (2000, with 2001 supplement), in which Chapter 18 includes provisions for building on expansive soils (through design, removal or stabilization) so that new construction will be protected. However, the USACE Report notes that the Residential Code of New York State (NYS DOS, 2003) does not provide in-depth guidance regarding design, construction, assessment, and repair of foundations in the soil conditions found in Amherst, and recommends that the Town develop additional guidelines for design/construction and assessment/repair. 	

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Landslide	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and further evaluation of the hazard was considered prudent.	<ul style="list-style-type: none"> • Review of NY State Hazard Mitigation Plan • Review of USGS Landslide Incidence and Susceptibility Hazard Map • Review of New York State Geological Survey landslide inventory mapping and database • Review of SHEL DUS database • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Erie County HAZNYs • Planning team feedback 	<ul style="list-style-type: none"> • Landslides are discussed in the NY state plan, which reports four significant landslide events in Erie County between 1837 and 2007. None are associated with reported fatalities. • USGS landslide hazard maps indicate that areas of moderate susceptibility/low incidence, and moderate incidence, exist within the county. Though much of the county's land area is mapped as low incidence. • The "Landslide Inventory Map of New York" produced by the New York State Geological Survey (NYSGS) in cooperation with the United States Geological Survey, plots the location of 11 landslide events in Erie County between 1837 and 1989. However, there are three areas noted as areas of slumping and landslides where individual slides are too numerous to map. Data sheets obtained from the NYSGS for most of the 11 mapped landslide events record \$0 in damages; a single event record was reported to have caused \$250,000 in damages (1980's dollars). Locations included: along Buffalo Creek in East Aurora; Springville / Route 39; Sardinia; Scajaquada Creek in Cheektowaga; and Cayuga Creek in Lancaster. Based on historic occurrences, affected areas have often been along creeks where rushing waters erode the toe of the bank. <p>The County HAZNY ranks landslides as the area's 6th highest natural hazard. While landslides are relatively infrequent events, they are noted to occur with no warning of onset with potentially severe damage to private property and public facilities.</p>	YES

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Land Subsidence	Identified as a significant hazard to be addressed in the plan at that time (Town of Amherst only).	Considered again and this hazard was determined not to be applicable for the plan update. The earlier plan's noted hazard in Amherst is more appropriately identified as "expansive soils". Please see above.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of USGS Fact Sheet 165-00 Land Subsidence in the U.S. Erie County HAZNYs Review of USACE "Town of Amherst, Soils and Residential Foundation Study" (2005) Planning team feedback 	<ul style="list-style-type: none"> The state plan delineates certain areas that are susceptible to land subsidence in New York. Mapping in the state plan and from USGS indicates that a few areas in the northeast and southeast of the County are underlain by carbonate karst rock such as limestone (in which the potential exists for subsidence caused by sinkholes). The Erie County HAZNY study did not include land subsidence as a hazard for consideration. Land subsidence is not listed as a significant potential hazard in the Erie County Comprehensive Emergency Management Plan USGS Fact Sheet 165-00 indicates that Erie County is located in an area where subsidence caused by compaction of aquifers or drainage of organic soils is not likely. As a general rule, land subsidence can be expected where it has occurred in the past. The state plan notes that new sinkhole formation in the karst areas is rare, while in contrast, subsidence occurring in areas that are already subsiding (expanding existing sink holes) are relatively common, occurring every few years. There are no known occurrences of sinkholes in Erie County. The issue in the Town of Amherst is not land subsidence, but rather, differential sediment of residential structures caused by expansive soils. 	NO
Tsunami	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of FEMA's Multi-Hazard Identification and Risk Assessment Planning team feedback 	<ul style="list-style-type: none"> Tsunamis are not discussed in the state plan. Since the southernmost border of Erie County is located approximately 300 miles from the ocean, and no record exists of a catastrophic Atlantic basin tsunami impacting the mid-Atlantic coast of the United States, FEMA mitigation planning guidance suggests that locations in the eastern U.S. north of Virginia have a relatively low tsunami risk and need not conduct a tsunami risk assessment at this time. 	NO
Volcano	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of USGS Volcano Hazards Program web site Planning team feedback 	<ul style="list-style-type: none"> No volcanoes are located within approximately 2,000 miles of Erie County. 	NO

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
OTHER					
Wildfire	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Review of NY State Hazard Mitigation Plan Review of NOAA NCDC Storm Events Database Review of SHEL DUS database. Review of NYSEMO and NYSDEC web sites Review of FEMA's Multi-Hazard Identification and Risk Assessment Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> Wildfires are discussed in the state plan as a hazard of concern. Parts of Erie County have experienced minor wildfires in the past, typically brush fires along railroad tracks; however, major blazes that damage or threaten developed property are rare. The SHEL DUS database reported only one wildfire in the County in 1962, causing roughly \$8,000 in property damage. The Erie County HAZNY study ranked wildfires as the 7th most significant natural hazard in the County of the 12 included in the study. 	YES
MAN-MADE					
Air Contamination	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this as a moderately low hazard According to historic events, if the hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan 	NO
Civil Unrest	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this as a moderately low hazard According to historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan 	NO

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Epidemic	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Potential impact throughout a large region Some potential for cascade effects Several hours warning of onset Serious injury or death is likely but not in large numbers 	YES
Explosion	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Potential impacts at a single location Cascade effects highly likely Regular event No warning of onset Serious injury or death is likely, but not in large numbers Moderate damage to private property Moderate structural damage to public facilities 	YES
Fire	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately high hazard Potential impact at a single location Some potential for cascade effects Frequent event No warning of onset Potential impacts: serious injury or death is likely, but not in large numbers; severe damage to private property, moderate structural damage to public facilities 	YES
Food Shortage	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard According to historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan. 	NO

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Fuel Shortage	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Could impact a large region Infrequent event More than one week warning of onset Based on historic events, if this hazard were to occur there would be little to no damage to private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to warrant detailed evaluation and inclusion in the mitigation plan. 	NO
Hazardous Materials at Fixed Sites	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately high hazard Potential impacts possible at several locations Cascade effects highly likely Frequent event No warning of onset Possible impacts: serious injury or deaths to large numbers, moderate structural damage to public facilities 	YES
Hazardous Materials in Transit	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately high hazard Potential impacts possible at several locations Some potential for cascade effects Frequent event No warning of onset Possible impacts: Serious injury or death is likely, moderate damage to private property, moderate structural damage to public facilities 	YES
Infestation	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a low hazard Rare event Serious injury or death unlikely Little to no damage to public facilities; moderate damage to private property According to historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to warrant detailed evaluation and inclusion in the mitigation plan 	NO

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Mine Collapse	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Rare event; Serious injury or death unlikely Only moderate damage to private property/public facilities expected According to historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan 	NO
Oil Spill	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Potential impact to a single location Some potential for cascade effects No warning of onset Serious injury or death unlikely Regular event; Several weeks recovery time Moderate damage to private property and public facilities 	YES
Radiological (Fixed Site)	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Serious injury or death is likely but not in large numbers Infrequent event According to historic events, if this hazard were to occur there would be little to no damage to private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan 	NO
Radiological (In Transit)	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Potential impact to only a small region; Cascade effects highly unlikely; Rare event; Serious injury or death is likely but not in large numbers Based on historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan 	NO

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Table 2.2
Documentation of the Hazard Evaluation Process

Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Structural Collapse	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately high hazard Affected area is very limited Severe damage to public and private property in perhaps more than one location, with possible serious injury and loss of life, but in small numbers Is expected to occur very infrequently based on historic occurrences Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan 	NO
Terrorism	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this as the county's only high hazard Potential impact throughout a large region Cascade effects highly likely; No warning of onset Difficult to accurately predict the probability of future events Possible impacts: serious injury or deaths to large numbers, severe damage to private property, several structural damage to public facilities Several weeks recovery time 	YES
Transportation Accidents	Identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately high hazard Potential impacts at a single location Some potential for cascade effects Occurs regularly No warning of onset Potential impacts: serious injury or deaths to large numbers, moderate damage to private property, moderate structural damage to private facilities 	YES
Utility Failure	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Could affect a large region Happens very infrequently; Serious injury or death unlikely According to historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan. 	NO

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Table 2.2 Documentation of the Hazard Evaluation Process					
Hazards Considered	2005 Hazard Assessment	2012 Hazard Assessment	How was this determination made?	Why was this determination made?	Identified as a significant hazard to be addressed in the plan update?
Water Supply Contamination	Not identified as a significant hazard to be addressed in the plan at that time.	Considered again and earlier assessment was determined to still be applicable for the plan update.	<ul style="list-style-type: none"> Erie County HAZNYs Planning team feedback 	<ul style="list-style-type: none"> HAZNY 2010 ranks this a moderately low hazard Serious injury or death unlikely Infrequent event According to historic events, if this hazard were to occur there would be little to no damage or private property or public facilities. Hazard is not considered to be significant enough to present a sufficient level of danger to detailed evaluation and inclusion in the mitigation plan. 	NO

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SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.3
Summary Results of the Hazard Identification and Evaluation Process

<p><u>ATMOSPHERIC</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Avalanche <input checked="" type="checkbox"/> Extreme Temperatures <input checked="" type="checkbox"/> Extreme Wind <input type="checkbox"/> Hailstorm <input type="checkbox"/> Hurricane and Tropical Storm <input type="checkbox"/> Lightning <input type="checkbox"/> Nor'easter <input checked="" type="checkbox"/> Tornado <input checked="" type="checkbox"/> Winter Storm <p><u>HYDROLOGIC</u></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Coastal Erosion <input type="checkbox"/> Dam Failure <input type="checkbox"/> Drought <input checked="" type="checkbox"/> Flood <input checked="" type="checkbox"/> Ice Jams <input type="checkbox"/> Coastal Storm Surge * <input checked="" type="checkbox"/> Wave Action 	<p><u>GEOLOGIC</u></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Expansive Soils <input checked="" type="checkbox"/> Landslide <input type="checkbox"/> Land Subsidence <input type="checkbox"/> Tsunami <input type="checkbox"/> Volcano <p><u>OTHER</u></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Wildfire <p><u>MAN-MADE</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Air Contamination <input type="checkbox"/> Civil Unrest <input checked="" type="checkbox"/> Epidemic <input checked="" type="checkbox"/> Explosion <input checked="" type="checkbox"/> Fire <input type="checkbox"/> Food Shortage <input type="checkbox"/> Fuel Shortage <input checked="" type="checkbox"/> Hazardous Materials at Fixed Sites <input checked="" type="checkbox"/> Hazardous Materials in Transit <input type="checkbox"/> Infestation <input type="checkbox"/> Mine Collapse <input checked="" type="checkbox"/> Oil Spill <input type="checkbox"/> Radiological (Fixed Site) <input type="checkbox"/> Radiological (In Transit) <input type="checkbox"/> Structural Collapse <input checked="" type="checkbox"/> Terrorism <input checked="" type="checkbox"/> Transportation Accidents <input type="checkbox"/> Utility Failure <input type="checkbox"/> Water Supply Contamination
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☒ = Hazard considered significant enough for further evaluation through the hazard risk assessment.

* = Lake Erie storm rises and seiches will be considered as part of the flood hazard.

SECTION 2 - RISK ASSESSMENT: IDENTIFICATION OF POTENTIAL HAZARDS

Table 2.4
Erie County's HAZNY¹ Analysis Results (2010)

Hazard	Identified for Inclusion in the Plan Update?	Analysis Rating	Classification
<u>Natural Hazards</u>			
Winter Storm	Yes	298	Moderately High
Earthquake	Yes	272	Moderately High
Severe Storms	Yes	260	Moderately High
Ice Storm	Yes	254	Moderately High
Tornado	Yes	250	Moderately High
Landslide	Yes	233	Moderately Low
Wildfire	Yes	231	Moderately Low
Ice Jam	Yes	210	Moderately Low
Flood	Yes	194	Moderately Low
Extreme Temperatures	Yes	172	Moderately Low
Wave Action	Yes	168	Moderately Low
Drought	No	158	Low
Dam Failure	No	149	Low
<u>Man-Made Hazards</u>			
Terrorism	Yes	340	High
HAZMAT (fixed site)	Yes	296	Moderately High
HAZMAT (in transit)	Yes	281	Moderately High
Fire	Yes	276	Moderately High
Transportation Accident	Yes	246	Moderately High
Structural Collapse	No	245	Moderately High
Explosion	Yes	236	Moderately Low
Oil Spill	Yes	236	Moderately Low
Civil Unrest	No	224	Moderately Low
Epidemic	Yes	221	Moderately Low
Radiological (Fixed Site)	No	209	Moderately Low
Food Shortage	No	200	Moderately Low
Water Supply Contamination	No	200	Moderately Low
Utility Failure	No	198	Moderately Low
Fuel Shortage	No	186	Moderately Low
Air Contamination	No	182	Moderately Low
Mine Collapse	No	168	Moderately Low
Radiological (in transit)	No	164	Moderately Low
Infestation	No	128	Low

¹ HAZNY (Hazards New York) is an automated hazard analysis program which asks questions concerning hazards faced by a community and, rates and ranks each hazard based upon the responses.

SECTION 3a- RISK ASSESSMENT: HAZARD PROFILES

Overview

This section includes detailed profiles of natural hazards identified in Section 2 as worthy of further evaluation in the overall risk assessment. Hazard Descriptions were provided in Section 2. In this section, hazard profiles contain information such as the hazard and its causes and impacts, the location and extent of areas subject to the hazard, known historical occurrences, and the probability of future occurrences. The profiles also include specific information noted by members of the planning committee and other stakeholders, including unique observations or relevant anecdotal information regarding individual historical hazard occurrences and individual jurisdictions.

Table 3a.1 summarizes each hazard, and whether or not it has been identified as a hazard worthy of further evaluation for each of the 44 municipal jurisdictions in the County. Following Table 3a.1, **Figure 3a.1** presents a map of Erie County for reference, including the most significant transport links and the location and boundaries of each participating jurisdiction.

Table 3a.1 Summary of Identified and Profiled Hazards by Municipality												
Jurisdiction	Extreme Temperatures	Extreme Wind	Tornado	Winter Storm	Coastal Erosion ¹	Flood ²	Ice Jams ³	Wave Action ⁴	Earthquake	Expansive Soils	Landslide ⁵	Wildfire ⁶
Erie, County of	■	■	■	■	■	■	■	■	■	■	■	■
Akron, Village of	■	■	■	■		■			■			■
Alden, Town of	■	■	■	■		■	■		■			■
Alden, Village of	■	■	■	■		■			■			■
Amherst, Town of	■	■	■	■		■			■	■	■	■
Angola, Village of	■	■	■	■		■			■		■	■
Aurora, Town of	■	■	■	■		■			■			■
Blasdell, Village of	■	■	■	■		■			■		■	■
Boston, Town of	■	■	■	■		■			■			■
Brant, Town of	■	■	■	■	■	■		■	■		■	■
Buffalo, City of	■	■	■	■		■	■	■	■		■	■
Cheektowaga, Town of	■	■	■	■		■	■		■		■	■
Clarence, Town of	■	■	■	■		■			■		■	■
Colden, Town of	■	■	■	■		■			■			■
Collins, Town of	■	■	■	■		■	■		■			■
Concord, Town of	■	■	■	■		■			■			■
Depew, Village of	■	■	■	■		■			■		■	■
East Aurora, Village of	■	■	■	■		■	■		■		■	■
Eden, Town of	■	■	■	■		■			■		■	■
Elma, Town of	■	■	■	■		■	■		■		■	■
Evans, Town of	■	■	■	■	■	■	■	■	■		■	■
Farnham, Village of	■	■	■	■		■			■		■	■
Gowanda, Village of	■	■	■	■		■	■		■			■
Grand Island, Town of	■	■	■	■		■			■			■
Hamburg, Town of	■	■	■	■	■	■		■	■		■	■
Hamburg, Village of	■	■	■	■		■			■		■	■
Holland, Town of	■	■	■	■		■			■			■

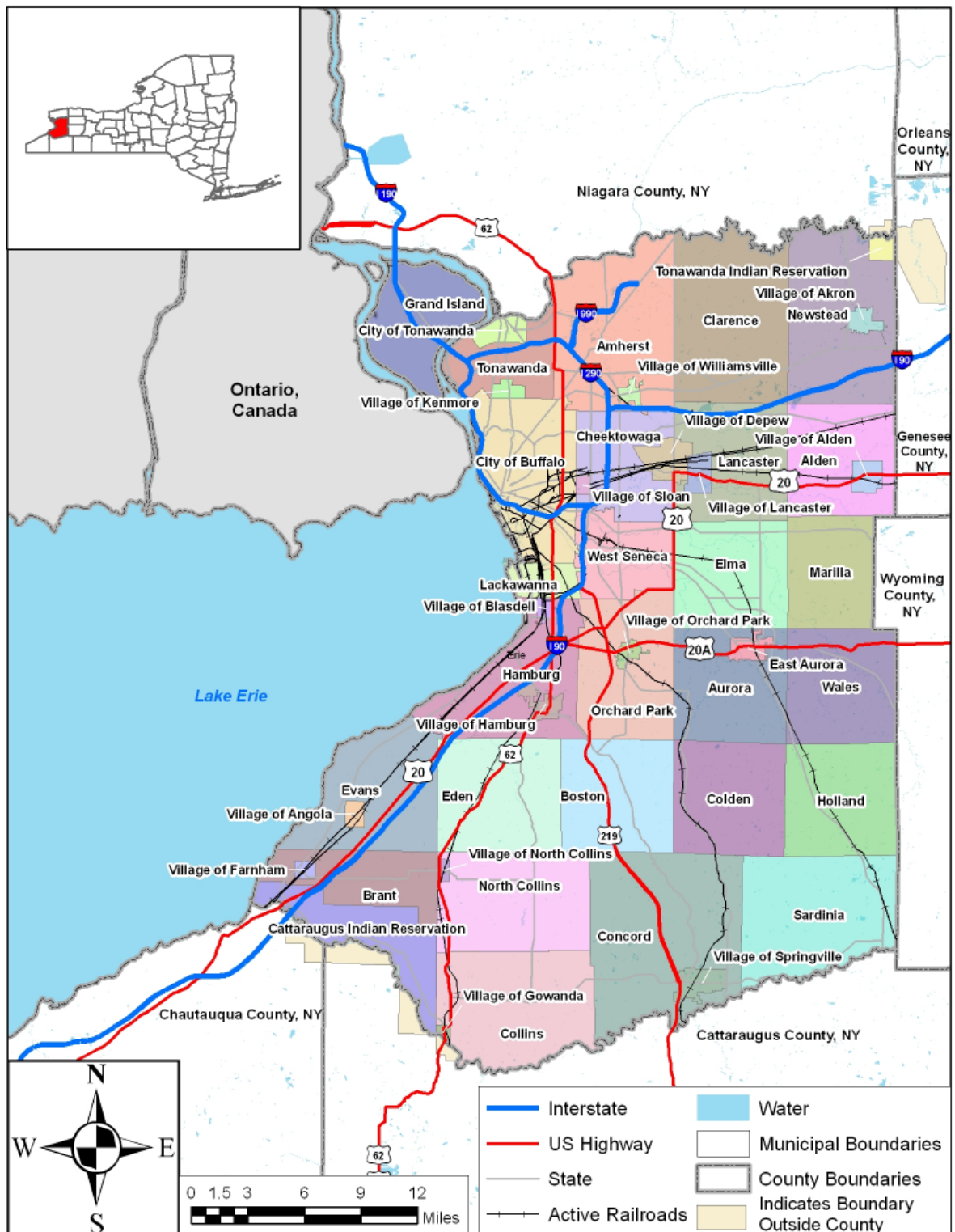
Table 3a.1
Summary of Identified and Profiled Hazards by Municipality

Jurisdiction	Extreme Temperatures	Extreme Wind	Tornado	Winter Storm	Coastal Erosion ¹	Flood ²	Ice Jams ³	Wave Action ⁴	Earthquake	Expansive Soils	Landslide ⁵	Wildfire ⁶
Kenmore, Village of	■	■	■	■		■			■		■	■
Lackawanna, City of	■	■	■	■		■	■	■	■		■	■
Lancaster, Town of	■	■	■	■		■			■		■	■
Lancaster, Village of	■	■	■	■		■	■		■		■	■
Marilla, Town of	■	■	■	■		■			■			■
Newstead, Town of	■	■	■	■		■			■		■	■
North Collins, Town of	■	■	■	■					■			■
North Collins, Village of	■	■	■	■		■			■			■
Orchard Park, Town of	■	■	■	■		■			■		■	■
Orchard Park, Village of	■	■	■	■		■			■		■	■
Sardinia, Town of	■	■	■	■		■			■		■	■
Sloan, Village of	■	■	■	■		■			■		■	■
Springville, Village of	■	■	■	■		■	■		■		■	■
Tonawanda, City of	■	■	■	■		■	■		■		■	■
Tonawanda, Town of	■	■	■	■		■			■		■	■
Wales, Town of	■	■	■	■		■			■		■	■
West Seneca, Town of	■	■	■	■		■	■		■		■	■
Williamsville, Village of	■	■	■	■		■	■		■		■	■

Notes to accompany **Table 3a.1**:

1. Based on NYSDEC Coastal Erosion Hazard Area maps
2. Based on identification of mapped flood hazard zones (FEMA DFIRMs)
3. Based on CRREL historical records, Flood Insurance Studies, and local information
4. Lake Erie coastal communities
5. Based on identification of improved property in mapped moderate incidence or moderate susceptibility landslide risk zones, plus those municipalities in which details of individual landslide events are available.
6. Based on identification of improved property in mapped wildfire hazard zones

Figure 3a.1: Erie County Base Map



SOURCE: ESRI, U.S. Counties, 2005; New York Major Roads, 2000; Erie County Municipal Boundaries, Erie County Street Centerlines, 2010; U.S. Census Bureau, Census Railroads, New York State, 2001; Area Hyrdography, NHD, USGS.

Extreme Temperatures

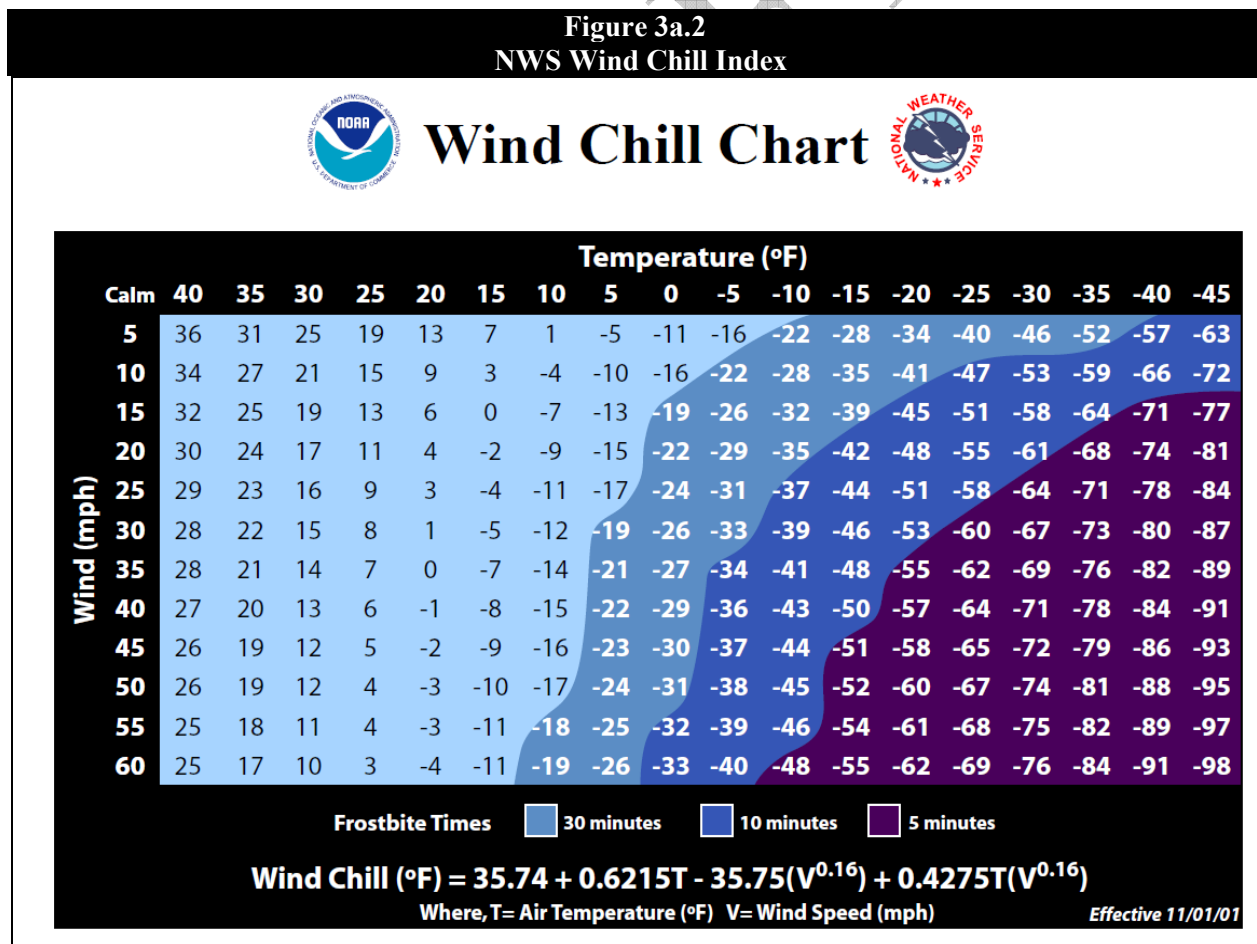
Location – Extreme Temperatures

Erie County is located in a region of the country that is susceptible to both extreme heat and extreme cold. During periods of extreme temperature conditions the effects will be felt over a widespread geographic area, and it is generally assumed that Erie County and all of its municipalities are uniformly exposed to extreme heat and extreme cold. The County's close proximity to Lake Erie produces a moderating effect upon summer temperatures. However, during the winter, arctic air masses and high winds across Lake Erie combine to produce very low temperatures, often below zero particularly when factoring in wind chills.

Extent – Extreme Temperatures

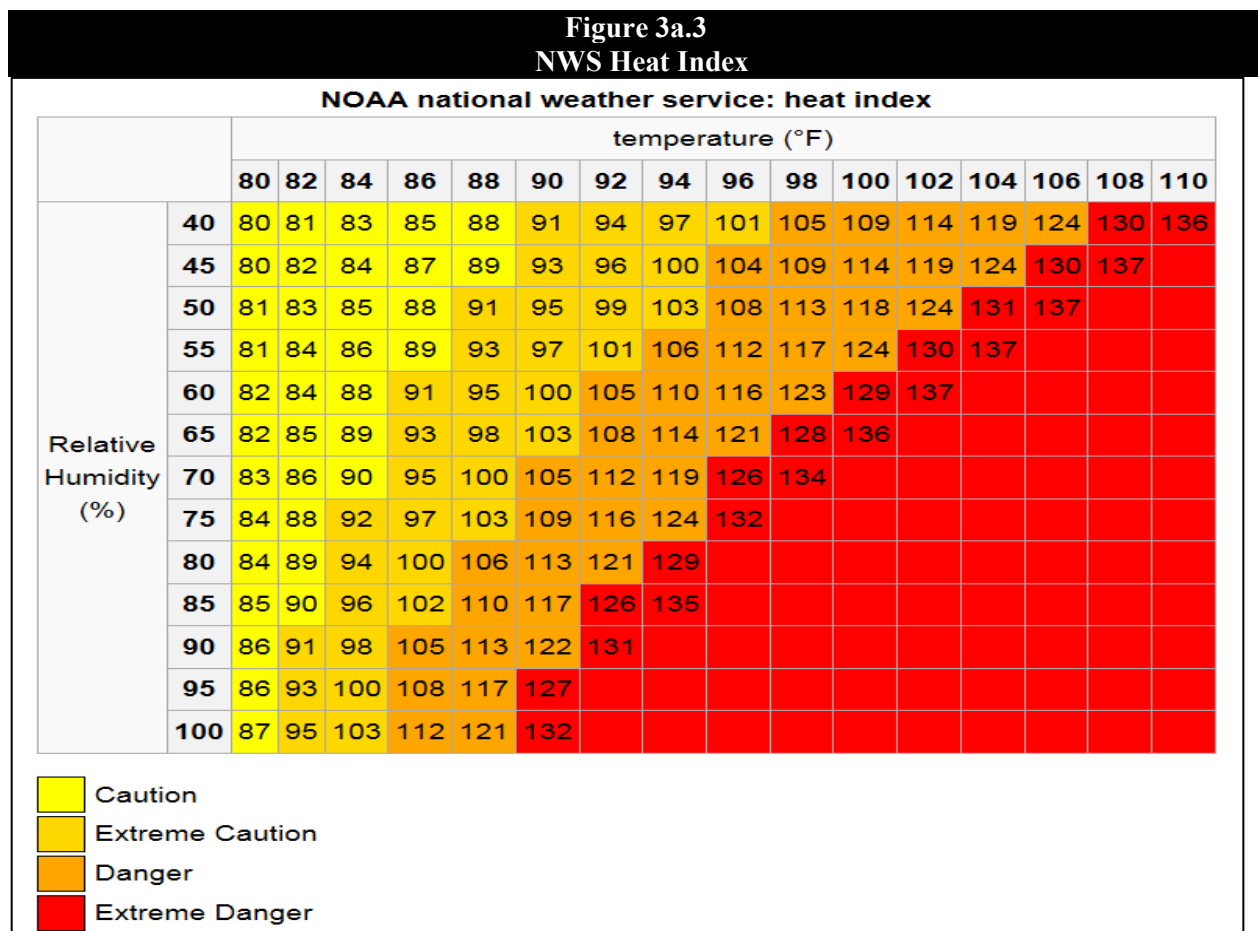
The speed of onset of extreme temperature events typically offers 24 hours of warning time. The duration of historic events in Erie County is typically less than one week. The extent of extremely cold temperatures is typically measured through the Wind Chill Temperature (WCT) Index. The WCT Index provides a formula for calculating the dangers from winter winds and freezing temperatures. It is, essentially, a calculation of the temperature that is felt when the effects of wind speed are added to the base air temperature. **Figure 3a.2** shows the NOAA NWS Wind Chill Chart.

Figure 3a.2
NWS Wind Chill Index



The extent of the extremely hot temperatures is typically measured through the Heat Index, which calculates the dangers from high relative humidity and extremely hot temperatures. It is, essentially, a

calculation of the temperature that is felt when the effects of relative humidity are added to the base air temperature. **Figure 3a.3** shows the NOAA NWS Heat Index.



Historical Occurrences – Extreme Temperatures

According to the New York State Climate Office, extreme cold events in New York State occur regularly, and are most common between October and March. They are most likely to occur in the northern and western portions of the state, and occur less often as one travels south toward New York City and Long Island. The record coldest temperature in New York State is -52°F at Stillwater Reservoir (northern Herkimer County) on February 9, 1934 and also at Old Forge (also northern Herkimer County) on February 18, 1979. Some 30 communities have recorded temperatures of -40°F or colder, most of them occurring in the northern one-half of the state and the remainder in the Western Plateau Division and in localities just south of the Mohawk Valley.

Extreme heat events in New York State also occur regularly, and are most common between May and mid-September. They are least likely to occur in the northern and western portions of the state, and occur more often as one travels south toward New York City and Long Island. The New York City area and most of the Hudson Valley record an average of from 18 to 25 days with such temperatures during the warm season, but in the Northern and Southern Plateaus the normal quota does not exceed two or three days. While temperatures of 100° are rare, many long-term weather stations, especially in the southern one-half of the State, have recorded maximums in the 100° to 105° range on one or more occasions. The

highest temperature of record in New York State is 108° at Troy on July 22, 1926. Temperatures of 107° have been observed at Lewiston, Elmira, Poughkeepsie, and New York City.

The National Climatic Data Center (NCDC) at NOAA holds extreme temperature event data for Erie County starting in February 1993. According to this database, Erie County has been included in the area affected by three relevant extreme temperature events (one extreme summer heat events, one extreme winter cold event, and one event of unseasonable warmth). A single death was attributed to one of the two extreme heat events, and a total of \$50,000 in property damages were reported for the extreme cold event. New York State has received no Federal Disaster or Emergency Declarations due solely to extreme temperatures. It should be noted that while the NCDC records seven specific extreme cold events in the County, the NCDC records Erie County as affected by a much larger number of winter storms involving snowfall and ice accumulation. These events are discussed in detail in subsequent sections. The Spatial Hazard Events and Losses Database for the United States (SHELDUS) does not report any additional events.

Extreme temperature events listed by NCDC as affecting Erie County include the following:

Extreme Cold - February 1, 1993. This extreme cold event was reported to have caused \$50,000 in property damage. No other information is available.

Extreme Heat - July 13, 2005. A 25-year old construction worker collapsed and died from heat stroke as he was walking home from his construction job.

Unseasonable Warmth - October 8, 1993. Period of unseasonably warm temperatures. No further information is available.

Probability of Occurrence – Extreme Temperatures

Extreme heat events and extreme cold events not involving other manifestations of severe winter weather are expected to remain a generally infrequent occurrence in Erie County, and the probability of future occurrences in Erie County is fairly certain, depending on the type of occurrence.

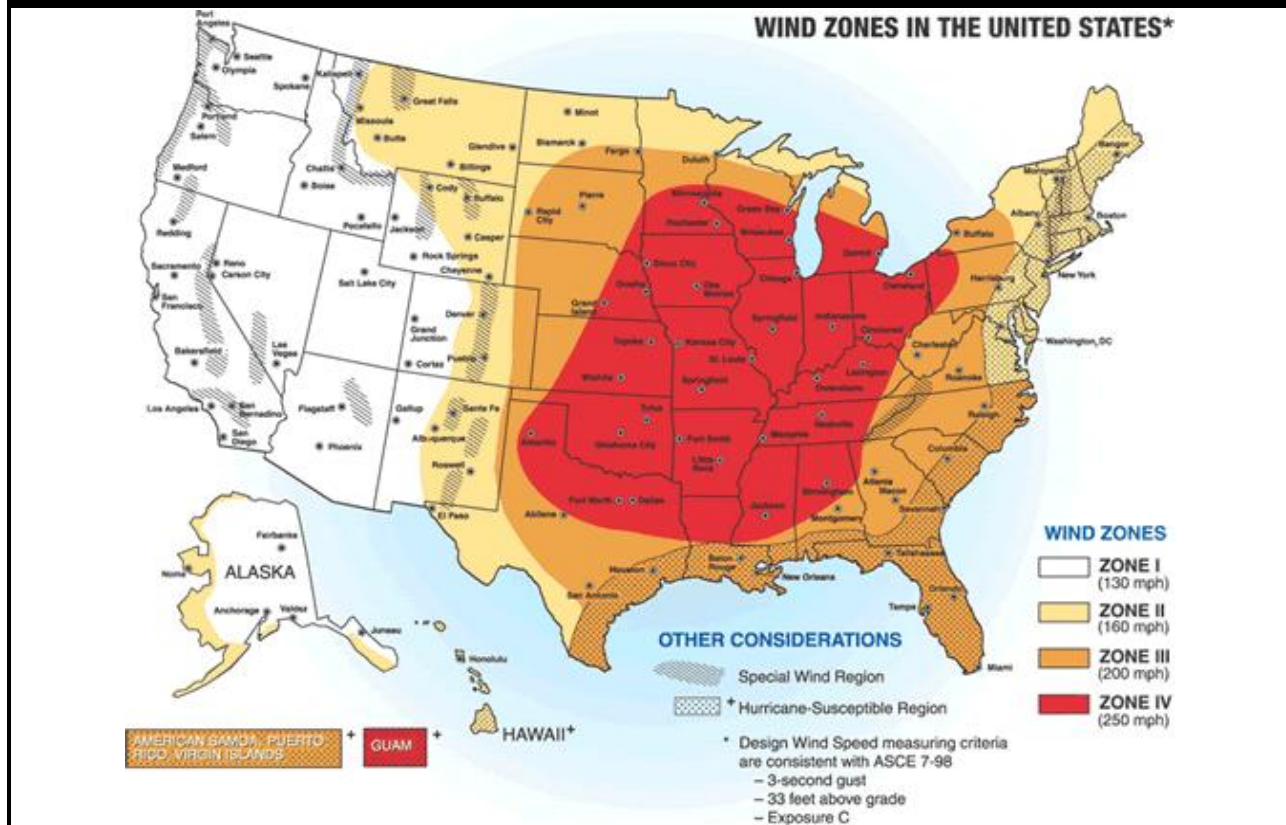
Based on historical records over the last 17 years, in New York State, extreme temperature events of all types can be expected to occur approximately 6.3 times per year. Of these, 4.1 are likely to be extreme cold events, and 2.2 are likely to be extreme heat events, making extreme cold events are likely to occur in any given year with approximately double the frequency of extreme heat. Based on NCDC records for Erie County, this trend is different in the planning area, where, based on NCDC records of the last 17 years, extreme heat events are generally as likely as extreme cold events. The Erie County 2010 HAZNY estimated that extreme temperature events occur infrequently in the County. Based on NCDC records, Erie County can expect to experience an extreme temperature event once every eight to nine years.

Extreme Wind

Location – Extreme Wind

Extreme wind events are experienced in every region of the United States. The extreme wind hazard area covers the whole of Erie County and the entire planning area is uniformly susceptible to the extreme wind hazard. **Figure 3a.4** illustrates various wind zones throughout the country based on design wind speeds established by the American Society of Civil Engineers. It divides the country into four wind zones, geographically representing the frequency and magnitude of potential extreme wind events including severe thunderstorms, tornadoes and hurricanes. The figure shows that all areas of Erie County are located within Zone III, with a design wind speed for shelters of 200 mph (3-second gust).

Figure 3a.4
Wind Zones in the United States



Source: Federal Emergency Management Agency

Extent – Extreme Wind

Extreme winds can occur alone, such as during straightline wind events and derechos, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe wind poses a threat to lives, property, and vital utilities primarily due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes. **Table 3a.2** illustrates the severity and typical effects of various sustained wind speeds. These would be reflective of high winds associated with thunderstorms, hurricanes, tropical storms and nor'easters. Typical effects of wind are very different for tornados; **Table 3a.3** illustrates the severity and typical effects of wind during tornados, as measured by various 3 second gusts. Note that tornados are addressed separately later in this plan section.

Table 3a.2 Severity and Typical Effects of Various Sustained Wind Speeds			
Sustained Wind Speed* (mph)	Equivalent Saffir-Simpson Scale** (Hurricanes)	Severity of Damage	Typical Effects
0-73 ($V_{3S}=0$ to 88)	N/A	ISOLATED	Isolated damage for winds below 50 mph. Above 50 mph, expect some minor damage to buildings of light material. Small branches blown from trees.
74-95 ($V_{3S}=89$ to 115)	1	MINOR	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
96-110 ($V_{3S}=116$ to 130)	2	EXTENSIVE	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
111-129 ($V_{3S}=131$ to 149)	3	DEVASTATING	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
130-156 ($V_{3S}=150$ to 176)	4	CATASTROPHIC	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
157 or higher ($V_{3S}>177$)	5	CATASTROPHIC	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: National Oceanic and Atmospheric Administration

* The 2003 International Building Code Table 1609.3.1 was used to convert Saffir-Simpson sustained wind speeds to 3-second gusts (V_{3S}) for the purposes of comparison between hurricane and tornado winds.

TABLE 1609.3.1
EQUIVALENT BASIC WIND SPEEDS^{a,b,c}

V_{3S}	85	90	100	105	110	120	125	130	140	145	150	160	170
V_{fm}	70	75	80	85	90	100	105	110	120	125	130	140	150

For SI: 1 mile per hour = 0.44 m/s.

a. Linear interpolation is permitted.

b. V_{3S} is the 3-second gust wind speed (mph).

c. V_{fm} is the fastest mile wind speed (mph).

** The Saffir-Simpson Scale is described further in this section under Hurricanes.

Table 3a.3
Severity and Typical Effects of Various Tornado Wind Speeds
(3-Second Gust)

Maximum Wind Speeds 3 Second Gust (mph)	Equivalent Enhanced Fujita Scale* (Tornadoes)	Severity	Typical Effects
65-85	EF0	LIGHT	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
86-110	EF1	MODERATE	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
111-135	EF2	SIGNIFICANT	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; highrise windows broken and blown in; light-object missiles generated.
136-165	EF3	SEVERE	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
166-200	EF4	DEVASTATING	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
Over 200	EF5	INCREDIBLE	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters (109 yard); trees debarked; steel reinforced concrete structures badly damaged.

Source: National Oceanic and Atmospheric Administration

* The Enhanced Fujita Scale is described further in this section under Tornadoes.

Historic Occurrences – Extreme Wind

Erie County has experienced numerous damaging extreme wind events in the past, including events associated with severe thunderstorms and tornadoes. NOAA's NCDC database records 287 high wind and thunderstorm wind events affecting Erie County between July 1956 and March 2011 (data includes wind events greater than 50 knots/57.5mph, with the exception of tornado events which are addressed separately within this section). It should be noted that detailed recording for this event category appears to have started in the mid-1980s (only 63 of these events are recorded before 1985), and descriptions are only available for wind events from the early 1990s onwards. These incidents resulted in a reported total of three deaths and 34 injuries across the region which they affected, as well as more than \$34 million in property damages and \$200,000 in crop damages. Some significant high wind events recorded by NCDC since 2005 for which the event descriptions specifically refer to impacts in Erie County include the events presented in **Table 3a.4**.

The SHELDUS database lists more than 335 storm events featuring high winds affecting Erie County since January 1960 (including 81 events recorded between 2005 and the present) to which approximately \$36.5 million in property damages was attributed. Since the SHELDUS database does not provide descriptions or locations of the impacts of individual events, the NCDC descriptions in Table 3a.3 will suffice to illustrate the effects of the high wind hazard in Erie County, and the SHELDUS data has been primarily used in the estimation of potential damages arising due to extreme winds in Section 3c.

SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

Table 3a.4 Selected Damaging Wind Events in Erie County Since 2005 <i>(Source: NOAA NCDC)</i>			
Date	Affected Areas	Description	Recorded Damages *
9/29/2005	Greater Buffalo Area	The thunderstorms accompanying the front produced damaging winds that downed trees and power lines. At the peak of the storms, over 30,000 customers were without power. Falling trees damaged homes and/or automobiles in Rochester, Silver Creek and Buffalo.	\$30,000
11/3/2005	Hamburg	While most of wind gusts ranged from 45 to 50 mph, the winds did knock down several large trees in Hamburg during the late morning hours.	\$4,000
8/2/2006	Tonawanda	Trees and limbs were downed in Constableville and Tonawanda.	\$8,000
9/11/2007	Orchard Park, Buffalo, Tonawanda	The thunderstorm winds downed trees and power lines. In Orchard Park, a 15- to 20-foot section of the Buffalo Bills Field house was torn off by the thunderstorm winds.	\$50,000
1/30/2008	various	Sustained winds increased to 30 to 45 mph with gusts measured to 80 mph at the peak of the storm. Trees and power lines were downed by the strong winds. Utility companies reported close to 100,000 customers without power in locations scattered throughout region. Several homes and automobiles were damaged by falling trees and limbs. On Grand Island, the roof a manufacturing company sustained significant damage. The Buffalo Airport was closed between 8:30 a.m. and noon with over half of its scheduled flights canceled for the day. In downtown Buffalo, a building from the 1850s that had been damaged in an earlier January windstorm, sustained further damage and was deemed unsafe and to be demolished.	\$250,000
12/28/2008	various	A peak gust of 75 m.p.h. was recorded at 8:21 a.m. EST at the Buffalo Airport. Close to 100,000 customers lost power during the storm and nearly 90,000 were without phone service. Downed trees damaged several structures and automobiles. The strong winds tore off roofs and shingles on many buildings. At the Buffalo Airport, wind gusts blew several jetways into the terminal building and the airport lost power during much of the storm. At Orchard Park, the wind tore a 2 feet by 50 feet section of the roof the Buffalo Bills field house. The wind picked up gravel and windows and windshields of numerous cars in the stadium parking lot were broken. Inside the stadium, the strong winds tilted both goal posts. Also near the stadium, a concession trailer was blown over with only minor injuries to the occupants reported.	\$250,000
2/12/2009	various	Wind gusts were measured to 69 mph with widespread estimated gusts between 55 and 60 mph. The strong winds downed trees and power lines. Electric utilities reported nearly 100,000 customers without power at the peak of the storm.	\$50,000
8/9/2009	various	Trees and wires were downed by thunderstorm winds in East Aurora, Forest Glen, Eden, Springville, Williamsville, Ebenezer	\$67,000
8/20/2009	Buffalo	The thunderstorms that developed produced damaging winds that downed trees and power lines.	\$15,000
12/9/2009	various	On the New York State Thruway, several tractor trailers were blown over as winds gusted to near 70 mph. As the system passed to the north, winds shifted to southwest and increased. Gusts were measured to 60 mph at the Buffalo International Airport. The winds downed trees and power lines and utilities reported tens of thousands without power.	\$750,000
10/26/2010	Falconwood, Cheektowaga	Thunderstorms accompanying the front produced damaging wind gusts to 60 mph. In Cheektowaga, a traffic signal at Union Road and George Urban Boulevard was blown down.	\$29,000

*May include damage incurred outside Erie County

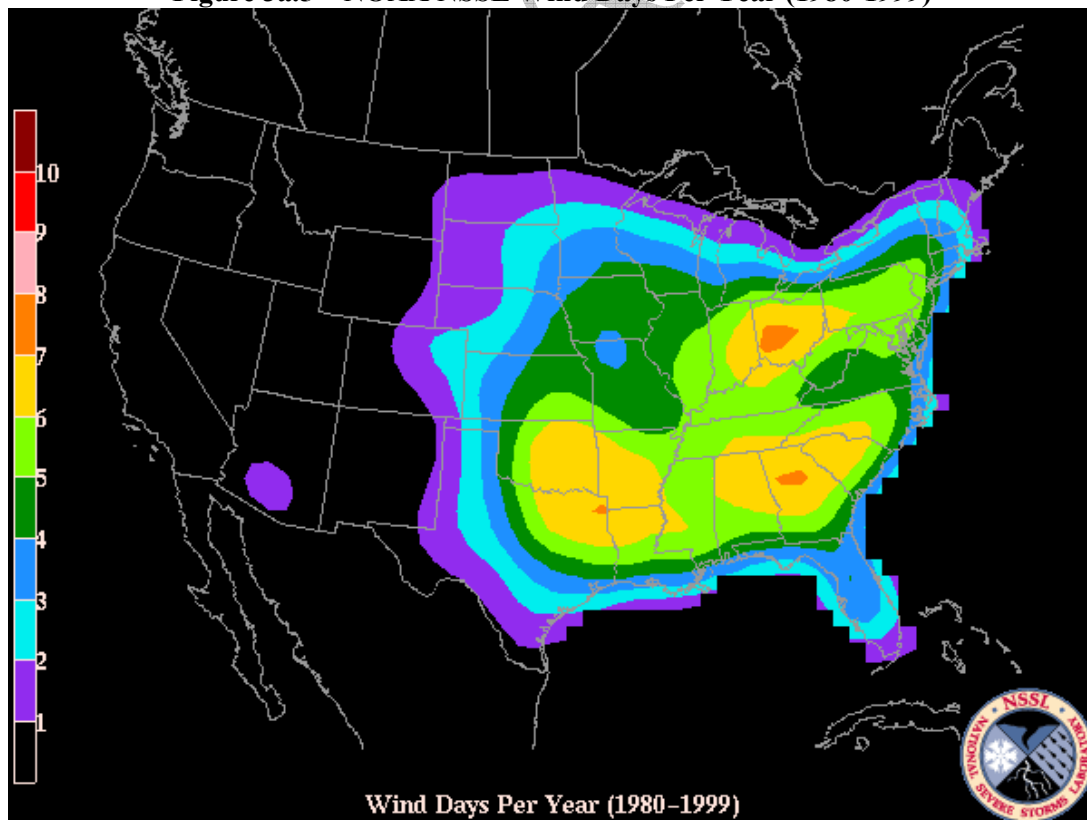
Probability of Occurrence – Extreme Wind

Extreme wind events will continue to have a high probability of occurrence in Monmouth County, and the probability of future occurrences in Erie County is certain. The entire planning area is susceptible to a wide variety of recurring events that cause extreme wind conditions including severe thunderstorms (most frequent) and tornadoes. **Table 3a.5** illustrates a summary of wind-related events in both New York and Erie County based on historic occurrences reported in NOAA's NCDC Storm Events Database during the period from 1960 to 2011, and provides an associated average annual number of storms. It shows an average annual number of events which featured wind in excess of 50 knots (57.5mph), in Erie County of at least 3.4 based solely on historical occurrences recorded by NCDC. Table 3a.5 does not include tornadoes, which are addressed later in this section.

Event Type	Total Number of Events in New York State	Total Number of Events in Erie County	Average Annual Number of Events in New York State	Average Annual Number of Events in Erie County
Thunderstorm and High Wind Events	9,413	287	188	5.7

NOAA's National Severe Storm Laboratory's hazard probability map for thunderstorm winds for 1980 to 1999 (**Figure 3a.5**) shows 2 to 4 wind days per year for Erie County where winds are 50 knots or greater (damaging).

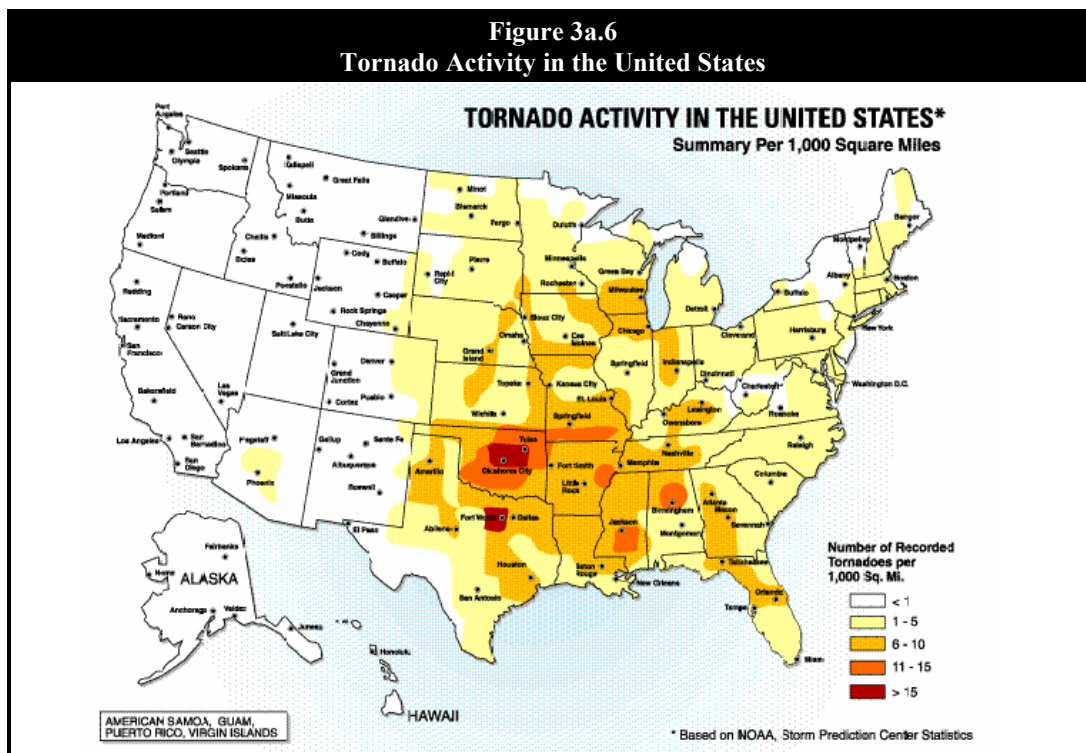
Figure 3a.5 – NOAA NSSL Wind Days Per Year (1980-1999)



Tornado

Location – Tornado

Erie County is located in an area that is susceptible to tornados, though their occurrence is not nearly as frequent or intense as it is in other regions of the country. Over 350 tornados have struck New York State since 1952. Most tend to be of low magnitude (from EF0 to EF2) and typically impact only relatively small areas. **Figure 3a.6** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles. Tornados are completely random and it is not possible to predict specific tornado hazard areas. Tornados can occur anywhere, and no one location is more susceptible than another. All of Erie County is uniformly exposed.



Source: Federal Emergency Management Agency







Extent – Tornado

Table 3a.6 shows the Enhanced Fujita Scale for Tornados which was developed to measure tornado strength and associated damages.

Historic Occurrences – Tornado

NOAA's NCDC records tornado event data for Erie County from April 1957 to March 2011, and records 18 tornados in the county in this 54-year period. The database lists seven of these events as being rated F0, six rated F1, four rated F2, and one rated F3. The reported damages caused by these events resulted in more than \$4.5 million in property damage and six injuries. No deaths have been reported for any of Erie County's historic tornados. The SHELDTUS database lists one additional tornado in Erie County in 1977, and attributes approximately \$250,000 in damages to this event, though no supplemental information regarding magnitude, location, or impacts is included. **Table 3a.7** provides a summary of all historic events.

SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

Table 3a.6 Enhanced Fujita Scale for Tornadoes				
Storm Category	Damage Level	3 Second Gust (mph)	Description of Damages	Photo Example
EF0	LIGHT	65–85	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.	
EF1	MODERATE	86–110	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.	
EF2	SIGNIFICANT	111–135	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; highrise windows broken and blown in; light-object missiles generated.	
EF3	SEVERE	136–165	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.	
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.	
EF5	INCREDIBLE	200+	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 m (109 yd); trees debarked; steel reinforced concrete structures badly damaged.	

Source: National Oceanic and Atmospheric Administration; Federal Emergency Management Agency

Table 3a.7 Recorded Tornado Events in Erie County (Source: NOAA NCDC, SHELDUS)				
Date	Location or County	Magnitude ¹	Impacts	Recorded Property Damage ²
4/25/1957	Erie	F1	None Reported	\$25,000
7/7/1961	Erie	F2	None Reported	\$250,000
6/9/1966	Erie	F0	None Reported	\$3,000
8/19/1970	Erie	F3	None Reported	\$250,000
8/23/1971	Erie	F2	None Reported	\$25,000
5/2/1972	Erie	F2	None Reported	\$250,000
6/30/1976	Erie	F1	None Reported	\$0,000
9/18/1977	Erie	Not reported	None Reported	\$250,000
7/30/1987	Erie	F2	None Reported	\$2,500,000
4/9/1991	Erie	F1	None Reported	\$25,000
5/1/1991	Erie	F0	None Reported	\$250,000

¹ Magnitudes in the NCDC database are still recorded using the Fujita Scale. Wind speeds are not included in these event records; therefore, exact conversation between F-scale and EF-scale cannot be done. However, in general: F0=EF0; F1=EF0 to EF2; F2=EF2 to EF3; F3=EF3 to EF5; F4=EF5; F5>EF5.

² May include damage incurred outside Erie County

Table 3a.7
Recorded Tornado Events in Erie County (Source: NOAA NCDC, SHELDUS)

Date	Location or County	Magnitude ¹	Impacts	Recorded Property Damage ²
7/12/1992	Erie	F1	None Reported	\$0
8/31/1993	Clarence	F1	A thunderstorm spawned a small tornado during the early morning hours. Downburst winds with an embedded tornado downed numerous trees; some were 1 to 1.5 feet in diameter and at least 100 feet high. Some structural damage to homes resulted due to falling trees and limbs.	\$500,000
9/23/1993	Grand Island	F0	The tornado first touched down on Grand Island where it ripped the antenna off a house and overturned outdoor lawn furniture. The tornado moved southeast downing some trees in Tonawanda.	\$50,000
6/24/1994	Angola	F0	The tornado mainly uprooted trees; one fell on a house.	\$50,000
8/28/1994	Amherst	F0	No description	\$50,000
9/25/1997	Evans Center	F0	Power lines and five large maple trees were downed.	\$15,000
4/28/2002	East Concord	F0	In the Town of East Concord, a weak tornado (winds between 70 and 75 mph) briefly touched down. A portion of the back and roof of an outbuilding were blown away, a pier was tossed across a pond, and trees were damaged.	\$35,000
6/30/2006	Cheektowaga	F1	A thunderstorm spawned a tornado which moved across the Town of Cheektowaga from the northwest to the southeast, initially touching down at 2:55 pm on Walden Avenue near Harlem Road. On Walden Avenue, a construction trailer was moved several hundred feet. The worker in the trailer suffered minor injuries. It then moved across the New York State Thruway, lifting a tractor trailer and depositing it on its side across the Jersey barrier; the driver suffered a broken leg. It then continued on a southeast trek damaging a 20 by 30 foot section of a wall on a warehouse and then downed trees as it crossed through central Cheektowaga. The tornado touched down several times along its path. Its final touchdown was at the Parkside Village Mobile Home Park around 3:05 pm where three mobile homes sustained significant damage and eight others sustained minor damage. The tornado was ranked an F1 with a path length of three miles and a width of 75 yards.	\$250,000

Probability of Occurrence – Tornado

It is likely that Erie County will continue to experience weak to moderate tornado events, though their frequency of occurrence will be relatively infrequent. Probability data made available through NOAA's National Severe Storms Laboratory (NSSL) indicate that Erie County is in an area that experiences less than one tornado event per year. Historical storm data made available through NCDC and SHELDUS confirm this data (18 confirmed events in 54 years, resulting in an estimated annual probability of a tornado event of 33 percent).

Winter Storm / Ice Storm**Location – Winter Storm**

The winter storm hazard area encompasses the whole of Erie County. Nearly the entire continental United States is susceptible to winter storms, but the degree of exposure typically depends on the normal expected severity of local winter weather. Erie County is accustomed to severe winter weather conditions and is prepared for the potential disruptions they might cause. These events are seen as a part of daily life during the winter months. Winter storms are generally considered to be particularly noteworthy types of events only when their magnitude or severity results in damage to specific structures and/or overwhelms local capabilities to handle disruptions to traffic, communications, and electric power. According to NOAA data, average annual snowfall in New York State ranges from a low of approximately 10 to 20 inches in the New York City / Long Island area, to over 200 inches in parts of the Adirondacks. For Erie County, **Figure 3a.7** indicates that average annual snowfall ranges from about 75 to 175 inches per year, with accumulations tending to be higher in the southern parts of the County. The average annual snowfall for the County seat in Buffalo is 96.8 inches, substantially more than the statewide average of 65 inches and one of the highest in the state. This can vary greatly from one year to the next, particularly if several major extended-period storms impact the area (during which snowfall totals can approach or exceed annual averages). Freezing rain is another common manifestation of winter storms. This occurs when precipitation that begins as snow at high altitude melts as it falls through zones with an air temperature above freezing, before encountering a colder layer prior to ground impact, causing it to freeze on contact with any object it encounters at ground level. Freezing rain frequently causes travel problems on roadways, breaks off tree limbs and brings down power and telephone cables. Erie County lies within an area which experiences an average of 12 to 15 hours of freezing rain per year, which is lower than many other areas of New York State (**Figure 3a.8**). Freezing rain is comparatively uncommon in the USA outside the northeastern states. All areas throughout the County are susceptible to the hazard effects of winter storms including snow and ice.

The geographic location of Erie County on the eastern shores of Lake Erie makes it a prime target for **lake effect** snowstorms. Lake-effect snow is produced when cold winds move across Lake Erie (primarily from west-to-east generally along the main axis of the lake) picking up water vapor and depositing it as snow on the lake's eastern (leeward) shores. This includes the entirety of Erie County. As a lake gradually freezes over, its ability to produce lake-effect precipitation decreases. Lake-effect snow tends to be most common from November to February. Towns and cities at higher elevations can expect even larger amounts of lake-effect snow. The heaviest lake-effect snows rarely occur right at the shoreline. Lake-effect snows extend further inland for events with higher wind speeds, with the most dramatic effects normally extending up to 70 miles inland. Lake-effect snowfalls tend to be most significant for higher fetches across open, unfrozen water. As shown by **Figure 3a.7**, lake-effect snow tends to impact southern regions of Erie County more than northern regions, contributing to higher average annual snowfall normals in that area.

Figure 3a.7: New York State Snowfalls

(Source: New York State Hazard Mitigation Plan)

Annual Snowfall Normals 1971-2000

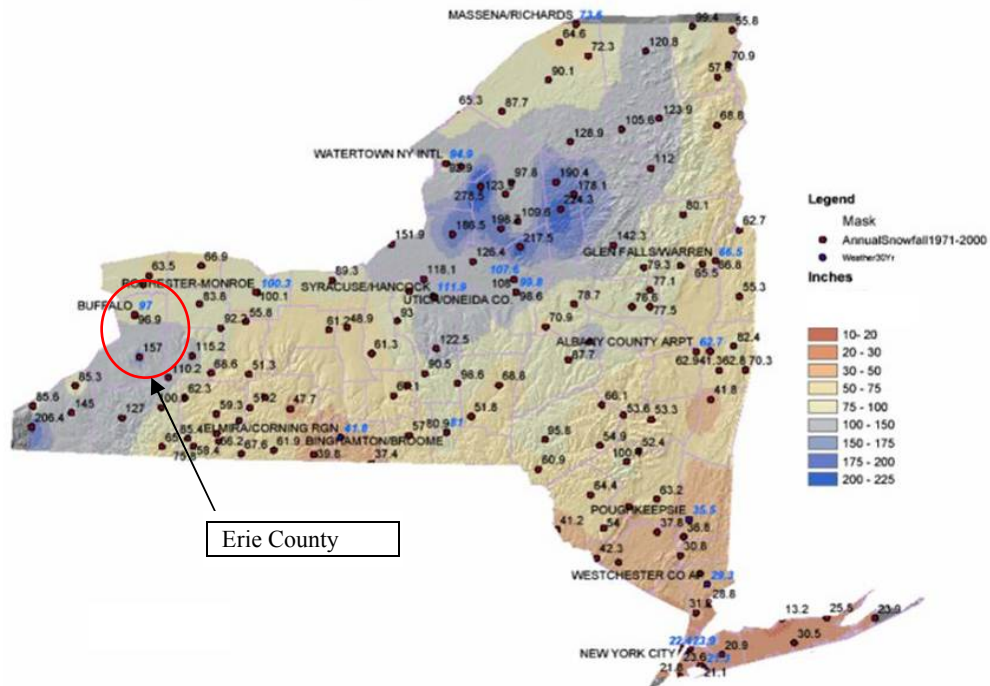
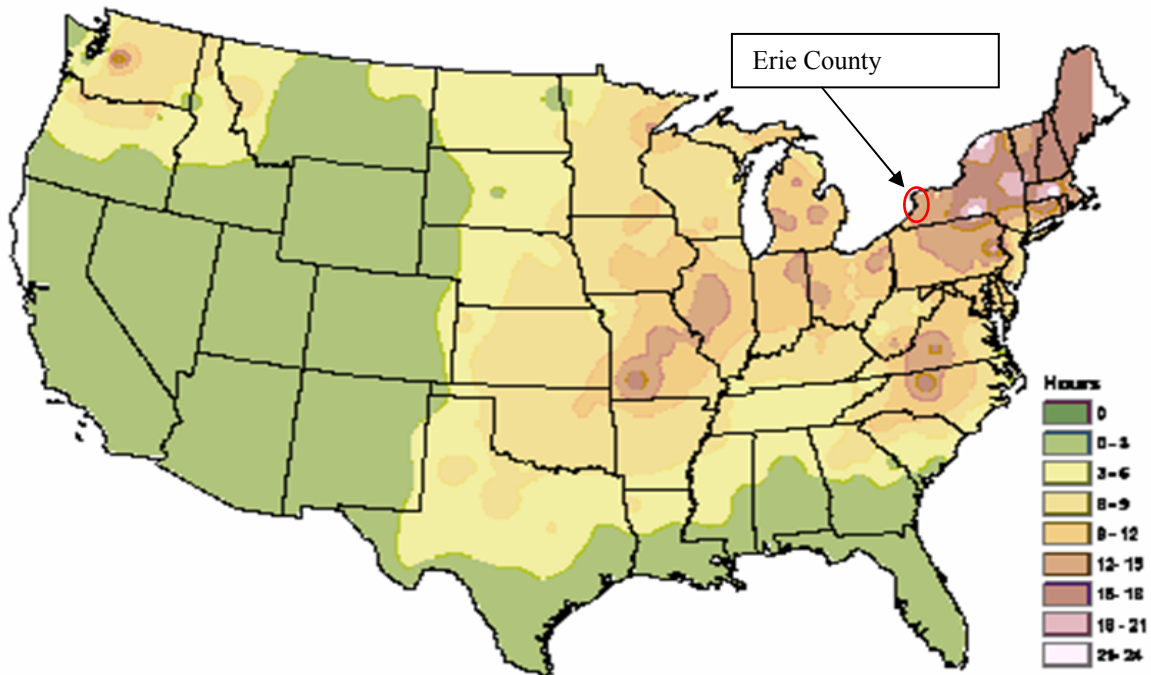


Figure 3a.8: Freezing Rain Zones Nationwide

Average number of hours per year with freezing rain in the United States.



Source: "FREEZING RAIN EVENTS IN THE UNITED STATES", National Climatic Data Center, Asheville, North Carolina

Extent – Winter Storm

The magnitude or severity of a severe winter storm depends on several factors including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and time of occurrence during the day (e.g., weekday versus weekend), and time of season.

The extent of a severe winter storm can be classified by meteorological measurements and by evaluating its societal impacts. NOAA's National Climatic Data Center (NCDC) is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from one to five. It is based on the spatial extent of the storm, the amount of snowfall, and the interaction of the extent and snowfall totals with population (based on the 2000 Census). The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA-NCDC 2011). **Table 3a.8** presents the five RSI ranking categories.

Table 3a.8		
Regional Snowfall Index Ranking Categories		
Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18.0+

Historic Occurrences – Winter Storms / Ice Storms

In Erie County, severe winter snow and ice storms are considered normal and expected. Winter storms and ice storms typically occur in from late October until mid-April in the planning area; peak months for these events for Erie County and its jurisdictions are generally December through March. A review of the New York State Hazard Mitigation Plan in conjunction with data from NOAA and FEMA shows that Erie County has been specifically included in six snow- or ice-related declared disasters and four snow- or ice-related emergency declarations, as detailed in **Table 3a.9**.

Table 3a.9				
Winter Storm Disaster/Emergency Declarations Affecting Erie County				
<i>(Source: NYSEMO / FEMA)</i>				
Declaration Type	Disaster/ Emergency #	Description	Date	Eligible Assistance for Erie County
Emergency	494	Ice Storm, Severe Storms, Flooding	03/19/76	Individual and Public Assistance
Disaster	3027	Snowstorms	01/29/77	Individual and Public Assistance
Emergency	527	Snowstorms	02/05/77	Individual and Public Assistance
Emergency	734	Snow Melt, Ice Jams	03/22/85	Public Assistance
Disaster	3107	Severe Blizzard	03/17/93	Public Assistance
Disaster	3136	Winter Storm	01/15/99	Public Assistance
Disaster	3157	Snow Storm	12/04/00	Public Assistance
Disaster	3170	Snowstorm	12/31/01	Public Assistance
Emergency	1404	Snowstorm	03/01/02	Public Assistance
Disaster	3268	Snowstorm	10/15/06	Public Assistance

In addition to this information, the NCDC database holds detailed snow and ice events for Erie County from January 1993 (when detailed NCDC records begin) to 2011, and a review of the NCDC database yielded 113 significant snow and ice events reported as having affected Erie County during this period.

These events are reported as being responsible for property damage totaling approximately \$95.1 million, although this includes damage reported in counties besides Erie County that were affected by the same events. Details and descriptions for some of the events are as follows:

Blizzard of 1977. This storm crippled Western New York with bitter cold temperatures and high winds bringing existing snow into the county off Lake Erie, yet deposited very little new snow.

January 3, 1993. A combination of a cold surface and warm moist air aloft created freezing rain and freezing drizzle which resulted in over a thousand traffic accidents throughout the area.

December 9-10, 1995. Known familiarly as the “Weekend Storm” (and meteorologically as “Gary”), this lake-effect snow storm was declared a snow emergency at the state level. A total of 37.9 inches of snow fell over a 24 hour period. Impacts were less severe because of the storm’s occurrence over the weekend when many people were home.

November 11, 1996. Lake effect snow squall persisted across the southern portion of the county for nearly three days dropping localized amounts of 10 to 22 inches.

December 19, 1996. Parts of the New York State Thruway were closed for more than 12 hours. Thirty to forty cars were stranded near Angola. A state of emergency was declared in Dunkirk and various municipalities imposed driving bans. Many school districts cancelled classes.

January 10, 1997. Some Buffalo suburbs received 24 to 30 inches of snow. During Saturday morning, over a foot of snow fell in just four hours over Amherst and Tonawanda.

March 14, 1997. Several inches of the icy slush coated trees and power lines, the weight of which downed the trees and lines. Various school districts throughout the area cancelled classes because of the treacherous conditions. Countless automobile accidents were reported.

December 5, 1997. Heavy snow closed the New York State Thruway from Ripley to the Pennsylvania state line.

March 2, 1998. It was the largest snowfall of the entire winter season in the Buffalo metro area. The snow made roadways extremely slick and innumerable accidents resulted. The heavy ice and snow on power lines and trees resulted in scattered power outages throughout the area.

January 1999. January 1-15. Known familiarly as the “Big Dump” (and meteorologically as “Europa”), this series of lake-effect and synoptic snow storms resulted in 60.5 inches of snow falling over a 15 day period, with a 24-hour maximum of 12.0 inches. A Federal snow emergency was declared. The cumulative effects of these storms caused extensive structural damage throughout the region. *January 15-25.* In Orchard Park, a man was injured when a garage collapsed on top of him during this period of excessive snow. Roof collapses and entire structure failures were numerous across the area. Numerous barns across the region collapsed under the excessive weight of the snow, in several dairy cows were injured and killed. Several garages collapsed damaging the automobiles and machinery inside them.

November 20, 2000. Known familiarly as “Gridlock Monday” for its occurrence during a Monday morning rush-hour, (and meteorologically as “Chestnut”), this lake-effect storm resulted in a Federal disaster declaration. The storm crippled much of the Buffalo metro area with 24.9 inches of snow falling in a 24-hour period. Tens of thousands of people were stranded in autos as city and suburban streets became clogged with traffic and came to a standstill. Three thousand school children were stranded in buses which were unable to complete their routes.

December 24, 2001-January 1, 2001. This well-forecasted, lake-effect storm known as the “Christmas Storm” or “Bald Eagle” storm resulted in a Federal disaster and emergency declaration. Over a nine-day period, 81.6 inches (6.8 feet) of snow fell. The 24-hour maximum accumulation was 35.4 inches. This

storm crippled Buffalo and surrounding areas; however, its occurrence over the holidays when schools and many businesses were already closed, thus minimizing the catastrophic nature of such a large snowfall.

April 3, 2005. Locally heavier amounts of up to two feet were reported along the ridges southeast of Lake Erie. Numerous accidents were blamed on the spring snowstorm. Tens of thousands were without power as the heavy snow downed trees, limbs and power lines.

October 12-13, 2006. This historic lake-effect snow storm was characterized by the NWS Buffalo Forecast Office as a “dramatic, crippling, out of season event”. Roughly one million residents of the Niagara Frontier lost power, some for as long as a week. With most trees still in full leaf at the time, damages to vegetation were the worst in recent memory. The 22.6 inches recorded at the Buffalo airport not only blew away any October record (6" in 1909, only 4 falls of 2" or more in 100 years in October), but was the 7th greatest snowfall ever at any time in Buffalo. Depths varied quite a bit, from a minimum of 2 to 10 inches in parts of Grand Island, to 24 inches in Depew and Alden. Even within the City of Buffalo there was marked variation in total accumulations, ranging from 20 inches in the north, to 15 inches downtown, and 10 inches to the south.

March 4-7, 2008. On March 4, general snow of four to six inches blanketed the entire region and was followed by several inches of sleet and up to a half inch of glaze from freezing rain. This system was followed on March 7 by a storm in which 21.6 inches of snow was measured at the Buffalo Airport - the greatest general (non-lake effect) snowfall in Buffalo in 24 years. Numerous automobile accidents were blamed on the slippery conditions and poor visibilities in falling and blowing snow.

December 1-2, 2010. This lake-effect snow storm began on the afternoon of December 1 and continued through December 2, burying parts of Buffalo and surrounding towns. Suburban Depew recorded 42 inches while Buffalo neighborhoods south of downtown got 39 inches, according to the National Weather Service. Hundreds of motorists were stranded overnight when jackknifed tractor trailers on the NYS Thruway just east of Buffalo blocked traffic.

February 25, 2011. A 30-mile stretch of the New York State Thruway between Hamburg and Dunkirk was closed due to multiple accidents. There were several reports of building collapses throughout the region from the weight of the snow which had built up throughout the snowy winter.

November 17-26, 2014. Erie County was hardest hit by lake-effect snow during much of the week before Thanksgiving. The Buffalo southtowns were hardest hit with some areas receiving over 7 feet of snow. A 132 mile stretch of the New York State Thruway was shut down. Snowfall rates were recorded as high as six inches per hour. The extraordinary snow loads took their toll on homes and businesses.

In addition to the events listed by NCDC, the SHELDUS database lists a further 177 winter storm events affecting Erie County since January 1960 (of which all but 35 were recorded before 1993) to which slightly \$45.7 million in property damages was attributed. Since the SHELDUS database does not provide descriptions or locations of the impacts of individual events, the NCDC descriptions above will suffice to illustrate the typical effects of snow and ice in Erie County, and the SHELDUS data has been primarily used in the estimation of potential damages arising due to winter storms in Section 3c.

Table 3: Greatest 24-Hour Snowfalls by Decade. Buffalo, NY, 1890-2002

1993 - 2002		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
December 27-28, 2001	35.4 inches	2
December 24-25, 2001	25.2 inches	4
November 20, 2000	24.9 inches	5
December 9-10, 1995	37.9 inches	1
March 13-14, 1993	17.2 inches	16
1983 - 1992		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
January 19-20, 1985	16.9 inches	17
February 27-28, 1984	19.4 inches	9
1973 - 1982		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
January 10-11, 1982	25.3 inches	3
Nov. 30 - Dec. 1, 1979	20.1 inches	7
December 2, 1976	16.6 inches	18
November 30, 1976	19.0 inches	10
1963 - 1972		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
January 22-23, 1966	18.2 inches	12
December 30, 1961	17.8 inches	13
1953 - 1962		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
December 26-27, 1956	16.0 inches	20
November 28-29, 1955	19.8 inches	8
1943 - 1952		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
November 15-16, 1949	17.4 inches	14
December 15-16, 1945	24.3 inches	6
1933 - 1942		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
March 17, 1936	19.0 inches	11
Prior to 1933		
<i>Date</i>	<i>Snowfall Amount</i>	<i>Rank</i>
February 11-12, 1910	16.1 inches	19
January 21-22, 1902	17.4 inches	15

Source: National Weather Service Forecast Office – Buffalo, NY

Probability of Occurrence – Winter Storms / Ice Storms

Winter storm events will remain a very frequent occurrence in Erie County, and the probability of future occurrences in the County is certain. The probability of future occurrences of severe snowfalls and ice storms is assessed in terms of frequency based on historical events. Using the historical data reported by the NCDC, **Table 3a.10** summarizes the occurrence of winter storm events and their annual occurrence: Erie County and its municipal jurisdictions have experienced 110 significant winter storms / ice storms recorded by the NCDC between 1993 and 2011, – an average of 6.1 events per year.

Table 3a.10
Occurrence of Winter Storms/Ice Storms, Erie County (1993 – 2011)
(Source: NOAA's NCDC Storm Events Database)

Event Type *	Total Number of Events	Average Annual Number of Events
Excessive Snow	3	0.17
Freezing Rain	1	0.06
Heavy Snow	87	4.83
Ice Storm	1	0.06
Snow Squall	5	0.28
Total	110	6.1

*** Event Type Definitions**

Freezing Rain: Rain or drizzle which falls in liquid form and freezes on impact with cold surfaces to form a glaze on the ground and exposed objects.

Heavy Snow: Snowfall of 6 inches or more in 12 hours or less, or 8 inches or more in 24 hours or less.

Ice Storm: Accumulations of 1/4 inch or more of freezing rain.

Winter Storm: Combination of two or more of the following winter weather events: heavy snow, freezing rain, sleet and strong winds.

Snow Squall: A snow squall is an intense, but limited duration, period of moderate to heavy snowfall, accompanied by strong, gusty surface winds and possibly lightning (generally moderate to heavy snow showers). Snow accumulation may be significant.

Coastal Erosion

Location – Coastal Erosion

The mapped locations of the Coastal Erosion Hazard Areas (CEHAs) in Erie County are included in **Appendix K**. These maps were provided by the Chief of the Coastal Erosion Management Section of the NYSDEC. The maps are dated 1988 and were available strictly in PDF format. While dated, the maps are the most current versions available. NYSDEC reviews the CEHA maps every 10 years and after the occurrence of major events, both human and natural, including coastal storms; map revisions are only required if the CEHA boundary changes by 25 feet or more. There are two categories of areas regulated by the CEHA and noted on the maps: the landward limit of Natural Protective Features (NPFs) and Structural Hazard Areas (SHAs). NPFs include the nearshore, beaches, bluffs, primary dunes, and secondary dunes. SHAs include areas landward of the NPFs and are found on shorelines which have a demonstrated long-term average annual recession rate of one foot per year or greater. The SHA is determined by multiplying the recession rate times 40 and is measured from the landward limit of the NPF. For Erie County, the CEHA boundary was drawn at the location of NPFs; CEHA maps did not include any mapped SHAs (areas with demonstrated long-term average annual recession rates of one foot per year or greater). **Mapped CEHAs exist in the Towns of Brant, Evans and Hamburg.** The City of Buffalo and the City of Lackawanna also border Lake Erie but do not have mapped CEHAs.

Extent – Coastal Erosion

Coastal erosion is measured as the rate of change in the position or displacement of a riverbank or shoreline over a period of time. Short-term erosion typically results from periodic natural events, such as flooding, hurricanes, storm surge, and windstorms, but may be intensified by human activities. Long-term erosion is a result of multi-year impacts such as repetitive flooding, wave action, sea level rise, sediment loss, subsidence, and climate change. The severity of coastal erosion is typically measured through a

quantitative assessment of annual shoreline change for a given beach cross-section of profile (feet or meters per year) over a long period of time. Erosion rates vary as a function of shoreline type and are influenced primarily by episodic events, but can be used in land use and hazard management to define areas of critical concern. Unfortunately, there is no uniform erosion rate database or GIS data layer that defines erosion rates or such areas of critical concern for Erie County's Lake Erie shoreline. As stated above, the current CEHA maps in Erie County do not document annual recession rates at this time. If these rates should become available in the future, they would provide a good measure of the extent of this hazard. Coastal erosion along Lake Erie is an ongoing process, which tends to be exacerbated during storm events as high winds drive waves into the leeward shoreline. The speed of onset of an erosive event, as well as its duration, would generally be that of the severe storm type causing the wave action. In Erie County, most severe storms of this nature would occur with several days warning time and durations around one day. The overall extent (strength/magnitude) would increase with increasing duration. Coastal erosion becomes most severe during storm periods, when water levels and wave action tends to increase rapidly. The degree of severity can be marked, but will vary based upon several factors, including: soil properties, orientation of the shoreline, storm-surge heights, wave characteristics, direction of storm movement, angle of wave approach, forward speed and duration of the storm, and lake water levels. Over time, erosive forces acting upon coastal shorelines can result in a landward retreat of the shoreline. In addition, continued short and long term erosion can erode protective beaches and damage structures built to offer protection from these hazards; severity is increased as damages are incurred to protective features, if not repaired.

Future versions of this hazard mitigation plan should re-evaluate the erosion hazard as soon as NYSDEC has GIS versions of the hazard areas made available to allow for more efficient viewing, sharing, and estimation of assets within the CEHA. At that time, GIS can be used to overlay the line representing the mapped CEHA with the County parcel data. For the purposes of this hazard mitigation planning project, an attempt was made to generate a rough estimate of the number of affected buildings by comparing the PDF versions of the 1998 CEHA maps side by side with 2008 aerial imagery available from Google Earth. Buildings were counted if any part of the structure appeared to be intersected by the CEHA line. This data is a best-estimate, but is strictly an estimate using this rudimentary methodology. Results are presented in **Table 3a.11**. Use of GIS at a later date will allow for not only a more exact count, but also estimates of land area within the CEHA, and the type and value of structures affected.

Table 3a.11	
Rudimentary Estimate of the Approximate Number of Buildings in the NYSDEC Mapped CEHA	
Community	Estimated Number of Buildings Affected
Brant, Town of	3
Evans, Town of	36
Hamburg, Town of	14
Total	53

Coastal erosion is a greater problem in parts of Hamburg and Evans because of residential homes and commercial activities close to the shore. The FEMA FIS notes that much of the Town of Hamburg has high bluffs, which experience serious erosion during storms. Residential and commercial exposure in Brant is limited in part because of Evangola State Park along much of the shoreline. In Buffalo, breakwaters provide protection. In the City of Lackawanna, most residential and commercial development is east of Route 5, with the Bethlehem Steel Lackawanna Plant on a wide swath of land west of Route 5 and no buildings immediately on the shoreline.

Historic Occurrences – Coastal Erosion

Historical occurrences of coastal erosion in Erie County have been identified using the NOAA NCDC database for ocean and lake surf events. The following details were recorded for some of these events:

December 12, 2000. The high winds caused water levels at the eastern end of Lake Erie to rise over five feet in a few hours. The high water levels coupled with waves of 10 to 14 feet caused shoreline erosion and localized flooding. Evacuations took place at Hoover Beach.

November 6, 2005. High water levels and waves of ten to fifteen feet resulted in some erosion of the lake shore and limited property damage.

January 30, 2008. The high water levels and waves to twelve to sixteen feet resulted in erosion of the lake shore and significant flooding at the extreme eastern end of the lake.

One example of coastal erosion impacting Erie County is in the Town of Evans. **Figure 3a.9** shows an aerial image of the shoreline, as shown on the 1988 CEHA map. In 1988 there was a narrow spit of land running along Hillside Road from the vicinity of Bennett Road north to the vicinity of Ainsworth Parkway, with Big Slater Creek entering Lake Erie just north of Ainsworth Parkway. By the time of the 2008 aerials (**Figure 3a.10**) one can see that the land eroded with Big Slater Creek entering Lake Erie in the vicinity of Pinhardt Road.

Probability of Occurrence – Coastal Erosion

Coastal erosion remains a natural, dynamic and continuous process for Erie County's coastal jurisdictions and its probability of occurrence to some degree is certain. Based on NCDC reported historic occurrences of three coastal erosion events between 2000 and 2011, Erie County may expect to experience a significant erosive event on the order of once every four to five years.



Figure 3a.10: Town of Evans Shoreline, 2008



Floods

Location – Flood

Erie County is subject to both riverine and coastal flooding. **Riverine flooding** occurs along inland channels such as rivers, creeks, streams. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas. **Coastal flooding**, on the other hand, is a result of the storm surge where local sea levels rise to inundate areas along the coasts of oceans, bays, estuaries, coastal rivers, and large lakes (Lake Erie coastal flooding, in the case of Erie County). Many areas of Erie County are also susceptible to urban (stormwater) flooding.

It is estimated that approximately six percent of lands within Erie County are located in the 100-year floodplain. **Figure 3a.11** illustrates the location and extent of currently mapped special flood hazard areas for Erie County based on FEMA's 2009 Preliminary Digital Flood Insurance Rate Maps (DFIRMs)³. This includes Zones A/AE/AO/AH (100-year floodplain, high risk areas), and Zone X500 (500-year floodplain, moderate risk areas); as well as Zone X (sometimes shown as Zone C on older maps, low risk areas outside of the 500-year floodplain where the flood hazard is minimal), and Zone D (areas where there are possible but undetermined flood hazards). It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas – particularly in areas that were not included in detailed study areas.

In addition to riverine flooding, Erie County communities bordering Lake Erie (the Cities of Buffalo and Lackawanna, and the Towns of Hamburg, Brant and Evans) are also potentially susceptible to coastal flooding from Lake Erie as a result of storm induced rises and seiches. Storm induced rises on Lake Erie can occur when high sustained winds from one direction push the water level up at one end of the lake and make the level drop by a corresponding amount at the opposite end. Water levels increase in height as the wind increases, resulting in storm induced rises as high as eight feet that are often sudden and unexpected. When combined with dramatic changes in atmospheric pressure or a sudden drop in the wind speed, storm surges can produce what is known as a seiche. A seiche has to occur in an enclosed body of water such as a lake, bay or gulf. A seiche, a French word meaning “to sway back and forth”, is a standing wave that oscillates in a lake as a result of seismic or atmospheric disturbances creating huge fluctuations of water levels in just moments. The standing waves then slosh back and forth between shores of the lake basin. Most seiches are the result of atmospheric disturbances and a cease in wind, as opposed to seismic activity or huge tidal forces. Mapping is not currently available to delineate specific locations in Erie County that are susceptible to the impacts of storm induced rises and seiches on Lake Erie. In general terms, impacted areas would be located in the municipalities bordering Lake Erie (the Cities of Buffalo and Lackawanna, and the Towns of Brant, Evans and Hamburg). The 2005 version of the Erie County Hazard Mitigation Plan stated that seiches can be a problem on any part of the Erie County shoreline but because of recreation and residential activities are a greater problem in parts of Hamburg and Evans, where there are residential homes and commercial activities close to the shore. The earlier plan noted cliffs along the shoreline in other areas muting the effects of seiches.

³ FEMA's 2009 Preliminary DFIRMs represented the best, readily available data at the time this plan was prepared for its submittal for agency review in 2012. Final DFIRMs should be incorporated into future plan updates. Future plan updates should also incorporate results of two RiskMap studies of Lake Erie and its watersheds, both of which are still ongoing as of November 2014.

Extent – Flood

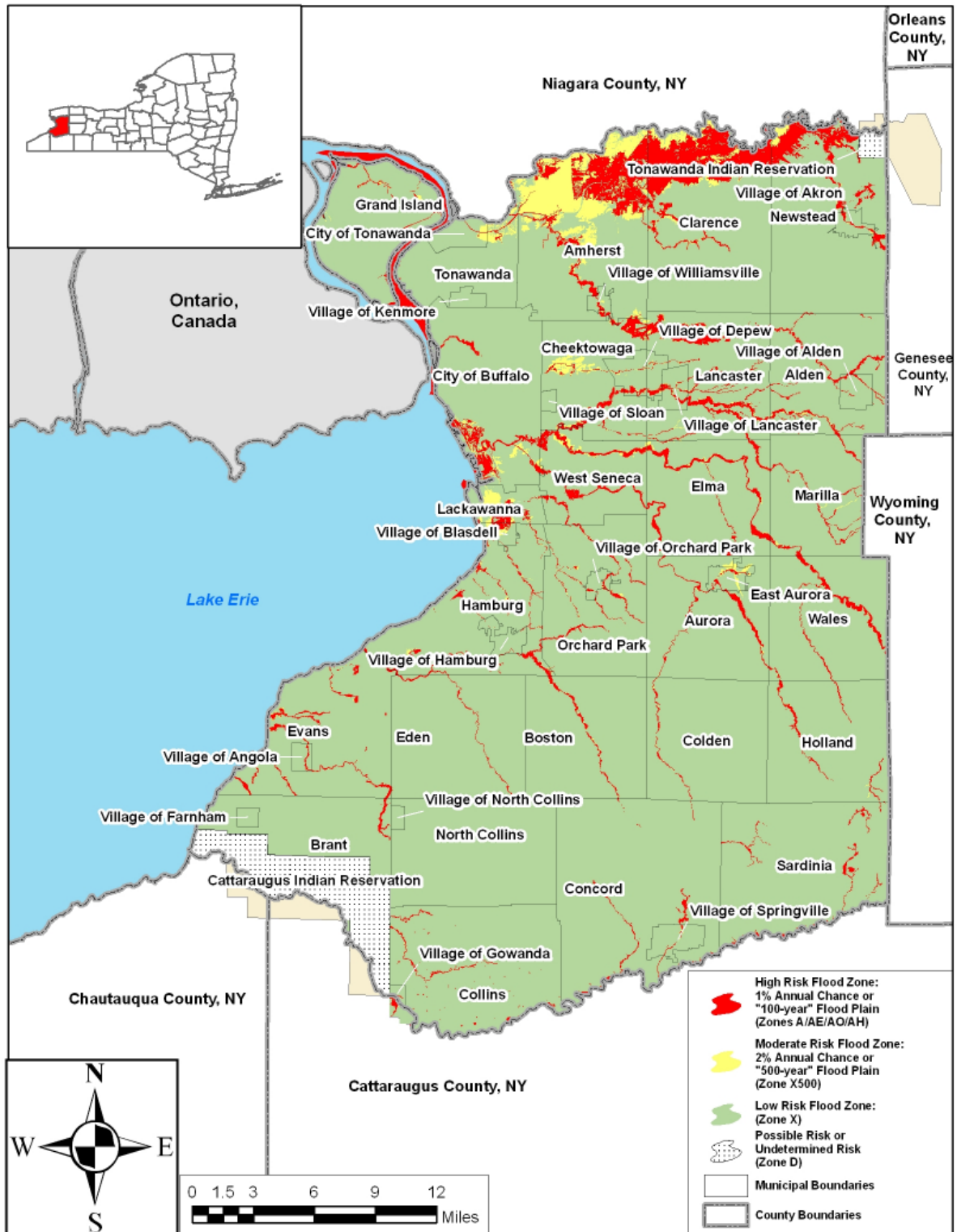
In the case of riverine flood hazard, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- Minor Flooding - minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations. (NWS 2011)

The extent of flooding associated with a 1% annual probability of occurrence (the base flood or 100-year flood, **Figure 3a.11** for Erie County) is used as the regulatory boundary by many agencies. Also referred to as the SFHA, this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities. Many communities have maps that show the extent and likely depth of flooding for the base flood. Corresponding water-surface elevations describe the water elevation resulting from a given discharge level, which is one of the most important factors used in estimating flood damage.

It is noted that, while a mapped floodplain does not exist in the Village of North Collins, storm runoff outside of mapped floodplains causes flooding in the northeast area of the Village. The Town of North Collins has jurisdiction as far as responsibility for maintaining proper drainage and stormwater management in this area.

Figure 3a.11: Erie County Flood Hazard Areas



SOURCE: ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, FEMA, Preliminary DFIRM Flood Data, 2009.

Historical Summary of Insured Flood Losses

The **National Flood Insurance Program (NFIP)** was established by Congress with the passage of the National Flood Insurance Reform Act of 1968. Through this program, Federally-backed flood insurance is made available to homeowners, renters, and businesses in a community if that community adopts and enforces a floodplain management ordinance to reduce future flood damages within its floodplains. This includes not only preventative measures for new development, but also corrective measures for existing development. At the time of writing, all but two municipalities in Erie County were active members of the NFIP. The Town and Village of North Collins were the only two communities in the County that were not participating in the NFIP (because they have no mapped floodplains). FEMA also administers the **Community Rating System (CRS)**, a program under which communities choosing to implement floodplain management actions that go beyond the minimum requirements of the NFIP become eligible for discounts on flood insurance premiums for properties within that community. The Town of Amherst and the City of Lackawanna were eligible for participation in FEMA's Community Rating System (CRS), under which municipalities implementing and enforcing floodplain management measures above beyond the NFIP minimum requirements are rewarded with discounted flood insurance premiums. As of June 1, 2014, the Town of Amherst is a Class 7 community, and the City of Lackawanna is a Class 9 community.

A picture of the flooding history of Erie County in terms of damage to private property over the last three decades or so can be derived from the recorded flood losses and payments data from the NFIP. This data is presented in **Table 3a.12**, along with the total number of current policies, the total coverage values, and key dates associated with the municipalities' participation in the NFIP. The policy and loss data presented in Table 3a.12 were downloaded from the FEMA web site in June 2011 and are current as of April 30, 2011. The table shows that Erie County NFIP insured flood losses have totaled approximately \$8.7 million since the 1970s, or approximately \$263,000 per year (given that most municipalities entered the NFIP in the period 1978 to 1982.) Actual property flood losses community-wide are likely to be higher, since this value only includes NFIP payouts and does not include losses incurred on properties the owners of which do not participate in the NFIP, losses for which a claim was not submitted, or losses for which payment on a claim was denied. FEMA records also include a further 672 flood damage claims against the NFIP in Erie County for which no payment was made. The average individual paid NFIP loss for the County overall was approximately \$5,547 per event, with an average coverage of approximately \$163,000 per policy. The municipalities with the greatest number of paid losses are the Village of Gowanda⁴ (Erie and Cattaraugus Counties included), Town of Hamburg, Town of Amherst, City of Buffalo, and Town of Brant. The highest average payment per loss in any single municipality is in the Village of Gowanda (\$21,772), closely followed by the Village of Springville (\$20,040) and Town of Collins (\$18,679). Of the 42 municipalities participating in the NFIP, one has no individual NFIP policies in place (Village of Alden), while one have not experienced any flood damage resulting in NFIP payments (Village of Sloan). Table 3a.10 also includes the name of the person in the administrative structure of each municipality to which the responsibilities of Floodplain Administrator are delegated by each locally adopted floodplain management ordinance, where this information is on file at FEMA. The names and contact details as currently held on record by Erie County (with supplemental information from FEMA Region 2) are included in **Appendix F**.

⁴ The Village of Gowanda is located in both Erie and Cattaraugus Counties. Flood prone areas of Gowanda are principally located in Cattaraugus County (the New York State Plan estimates 148 residential properties on the Cattaraugus side, as compared to only 15 on the Erie County side, or roughly 10 percent). FEMA policy and loss data is not broken down between the two counties. The Village of Gowanda row in the table documents FEMA's reported data and includes both counties. However, when tallying total insured losses in Erie County, for the purposes of this plan, it has been assumed that 10 percent of the reported policy and loss statistics data for the Village of Gowanda are attributable to Erie County, and the remaining 90 percent are more appropriately attributed to Cattaraugus County. If better data should become available in the future, this section should be revised accordingly.

SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

Table 3a.12
FEMA NFIP Policy and Claim Information for Erie County Jurisdictions

Source: www.fema.gov/cis/NY, www.bsa.nfipstat.com, as of 4/30/2011

NFIP Participating Communities in Erie County, NY	Community Number	Date Entered NFIP*	Current Effective FIRM Date	Local Floodplain Administrator On Record At FEMA**	NFIP Policies In Force	Insurance in Force (\$)	Total Number of Paid Losses	Total Payments (\$)
Akron, Village of	361553	5/31/1974	11/19/1980	Donnal D. Folger	8	\$ 973,300	3	\$ 8,104
Alden, Town of	360225	5/31/1974	2/6/1991	Frank A. Trybuskiewicz	10	\$ 1,546,300	9	\$ 70,071
Alden, Village of	360224	5/13/1974	01/06/1984(M)	Joseph W. Czechowski	0	\$ 0	5	\$ 4,711
Amherst, Town of	360226	3/8/1974	10/16/1992	Thomas C. Ketchum	1,262	\$ 250,449,300	270	\$1,213,682
Angola, Village of	360982	12/6/1974	8/6/2002	Charles Labarber	1	\$ 77,000	17	\$ 91,619
Aurora, Town of	360227	4/16/1979	4/16/1979	Patrick Blizniak	11	\$ 2,376,300	11	\$ 98,974
Blasdell, Village of	361489	11/22/1974	6/25/1976(M)	Jeffry C. Adrian	2	\$ 364,000	17	\$ 150,556
Boston, Town of	360228	4/12/1974	9/30/1981	David J. Shenk	9	\$ 2,134,100	13	\$ 87,636
Brant, Town of	360229	6/14/1974	01/06/1984(M)	Frederick E. Ball	3	\$ 463,300	92	\$ 307,623
Buffalo, City of	360230	6/28/1974	9/26/2008	Joseph Gaimbra	182	\$ 22,157,300	276	\$1,064,575
Cheektowaga, Town of	360231	9/7/1973	3/15/1984	William R. Pugh	129	\$ 28,750,900	140	\$1,196,687
Clarence, Town of	360232	5/17/1974	3/5/1996	Joseph D. Latona	119	\$ 19,997,600	22	\$ 68,814
Colden, Town of	360233	5/31/1974	7/2/1979	Barnard Horschel	6	\$ 1,202,900	3	\$ 3,564
Collins, Town of	360234	8/2/1974	9/26/2008	Gene D. Degman	5	\$ 1,298,900	4	\$ 74,715
Concord, Town of	360235	8/2/1974	9/4/1986	Gary A. Eppolito	6	\$ 587,000	8	\$ 58,398
Depew, Village of	360236	2/22/1974	8/3/1981	Michael Wozniak	22	\$ 3,875,300	22	\$ 23,675
East Aurora, Village of	365335	7/20/1973	8/6/2002	Patrick Blizniak	37	\$ 6,635,900	28	\$ 93,229
Eden, Town of	360238	9/20/1974	8/24/1979(M)	Glenn R. Nellis	4	\$ 701,300	5	\$ 35,311
Elma, Town of	360239	9/21/1973	6/22/1998	Joseph Collern	26	\$ 6,177,400	18	\$ 40,893
Evans, Town of	360240	5/31/1974	2/2/2002	Charles Labarbera	177	\$ 18,508,600	57	\$ 399,628
Farnham, Village of	361588	5/26/1978	NSFHA	Linda Giancarlo	1	\$ 100,000	1	\$ 2,445
Gowanda, Village of***	360075	2/8/1973	9/26/2008	Paul Bowers	110	\$ 10,497,800	112	\$2,242,552
Grand Island, Town of	360242	8/2/1974	9/26/2008	John C. Whitney	50	\$ 11,217,400	20	\$ 32,517
Hamburg, Town of	360244	8/30/1974	12/20/2001	Kurt Allen	143	\$ 24,447,600	124	\$1,303,251
Hamburg, Village of	360243	10/29/1976	1/20/1982	William Ferguson	12	\$ 2,259,800	14	\$ 173,401
Holland, Town of	360245	6/14/1974	9/26/2008	R. Scott Hegs	2	\$ 286,000	1	\$ 2,738
Kenmore, Village of	361590	5/26/1978	NSFHA	Kathleen P. Johnson	4	\$ 1,120,000	7	\$ 3,379
Lackawanna, City of	360247	6/28/1974	7/2/1980	Joseph G. Geyer	485	\$ 35,604,900	63	\$ 110,593

SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

Table 3a.12
FEMA NFIP Policy and Claim Information for Erie County Jurisdictions

Source: www.fema.gov/cis/NY, www.bsa.nfipstat.com, as of 4/30/2011

NFIP Participating Communities in Erie County, NY	Community Number	Date Entered NFIP*	Current Effective FIRM Date	Local Floodplain Administrator On Record At FEMA**	NFIP Policies In Force	Insurance in Force (\$)	Total Number of Paid Losses	Total Payments (\$)
Lancaster, Town of	360249	5/24/1974	2/23/2001	Jeffrey H. Simme	82	\$ 14,359,400	30	\$ 305,203
Lancaster, Village of	360248	4/12/1974	7/2/1979	William R. Natalzia	13	\$ 1,765,700	1	\$ 4,698
Marilla, Town of	360250	5/17/1974	9/29/1978	Fred G. Specht	10	\$ 1,048,700	1	\$ 15,190
Newstead, Town of	360251	4/12/1974	5/4/1992	Martin Dugan	36	\$ 4,747,700	4	\$ 24,938
North Collins, Town of	No record of NFIP participation							
North Collins, Village of	No record of NFIP participation							
Orchard Park, Town of	360255	8/9/1974	3/16/1983	Andrew Geist	26	\$ 3,432,200	5	\$ 8,609
Orchard Park, Village of	360254	6/7/1974	NSFHA	Jeffrey Sweet	16	\$ 2,718,900	4	\$ 59,651
Sardinia, Town of	360256	6/28/1974	1/16/2003	Marvin D. Zielonka	4	\$ 626,300	3	\$ 19,370
Sloan, Village of	361589	5/26/1978	NSFHA	Kenneth Pokorski (CEO)	2	\$ 148,000	0	
Springville, Village of	360258	5/17/1974	7/17/1986	Michael Kaleta	14	\$ 1,855,800	16	\$ 320,646
Tonawanda, City of	360259	5/31/1974	9/26/2008	Kevin A. Rank	5	\$ 1,010,000	7	\$ 20,002
Tonawanda, Town of	360260	6/7/1974	11/12/1982	Michael J. Kaiser	32	\$ 6,742,500	29	\$ 47,545
Wales, Town of	360261	5/10/1974	9/26/2008	Dave Mosiee	2	\$ 225,000	2	\$ 2,133
West Seneca, Town of	360262	10/12/1973	9/30/1992	George D. Montz	192	\$ 31,560,900	110	\$ 383,794
Williamsville, Village of	360263	5/31/1974	9/26/2008	Jeffrey C. Adrian	43	\$ 8,113,800	91	\$ 514,737
Erie County, Total ***:					3,304	\$531,718,500	1,656	\$10,689,857

* i.e. Initial Firm identified ** From *Region 2 Community Listing of CEO and FPA of 11/7/07* on FEMA Region 2 Hazard Mitigation Planning ToolKit CD. Core Planning Group Members provided additional information; see Appendix F for more details.

*** The Village of Gowanda is partly in Erie County and partly in Cattaraugus County. Totals are for the entire Village, not just the Erie County portion. This may inflate Erie County total estimates, particularly given the significance of the 2009 flood event in Gowanda, particularly since much of the Gowanda flood hazard area is in Cattaraugus County. Gowanda data is also current as of 01/31/12.

Repetitive Losses

FEMA defines a Repetitive Loss Property (RLP) as any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 122,000 repetitive loss properties nationwide, and approximately 7,000 in New York State. According to FEMA's repetitive loss property records, there were a total of 112 RLPs in Erie County of which 92 were identified as "non-mitigated" as of February 2012. RLPs are associated with a total of 276 individual losses and \$3,049,220 in claims payments under the NFIP since March 1979 (the earliest recorded date of loss); 232 of these losses and \$2,540,074 in claims payments are associated with non-mitigated RLPs. The distribution of RLPs throughout the County is presented in **Figure 3a.12**, while the approximate locations of individual RLPs are plotted in **Figures 3a.13 through 3a.16**. Most RLPs are residential properties. More details regarding these properties are presented in **Table 3a.13**.

Eleven of the RLPs in Erie County have been categorized as "Severe" RLPs, where a Severe RLP is defined by FEMA as a residential property:

- (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than ten days apart.

More specific data regarding the exact locations of these structures is subject to the 1974 Privacy Act. This legislation prohibits the public release of any information regarding individual NFIP claims or information which may lead to the identification of associated individual addresses and property owners. However, while this information is not available to the general public, municipal authorities may obtain comprehensive RL property data directly from FEMA Region 2 for the purposes of targeted mitigation of RL areas or individual RL structures, on the condition that all such data is treated as strictly confidential and the required privacy procedures are strictly followed.

Note that a subset of the RLPs could not be address-matched with their parcel data using GIS and therefore some property types and flood hazard zones could not be determined.

Table 3a.13
NFIP Repetitive Loss Properties in Erie County
(Source: FEMA Region 2)

Municipality	Property Type *	Mitigated?	Flood Hazard Zone *	Number of Losses	Total Paid Losses	Average Paid Loss	SRL Indicator **
Alden, Town of	UTD	NO	AE	2	\$51,365	\$25,683	
Amherst, Town of	1 Family Residential	NO	X	3	\$9,846	\$3,282	
Amherst, Town of	1 Family Residential	YES	X	2	\$7,579	\$3,789	
Amherst, Town of	1 Family Residential	YES	X	2	\$4,323	\$2,161	
Amherst, Town of	1 Family Residential	YES	X	2	\$6,938	\$3,469	
Amherst, Town of	1 Family Residential	YES	X	2	\$4,883	\$2,442	
Amherst, Town of	1 Family Residential	YES	X	2	\$6,220	\$3,110	
Amherst, Town of	1 Family Residential	YES	X	2	\$8,082	\$4,041	
Amherst, Town of	UTD	YES	X	2	\$7,772	\$3,886	

SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

Table 3a.13
NFIP Repetitive Loss Properties in Erie County
(Source: FEMA Region 2)

Municipality	Property Type *	Mitigated?	Flood Hazard Zone *	Number of Losses	Total Paid Losses	Average Paid Loss	SRL Indicator **
Amherst, Town of	1 Family Residential	YES	X	2	\$24,786	\$12,393	
Amherst, Town of	1 Family Residential	NO	X	3	\$66,178	\$22,059	
Amherst, Town of	1 Family Residential	YES	X	2	\$3,172	\$1,586	
Amherst, Town of	1 Family Residential	YES	X	2	\$11,201	\$5,601	
Amherst, Town of	Commerical Shop Ctr	NO	X	2	\$38,976	\$19,488	
Amherst, Town of	1 Family Residential	YES	X	2	\$17,330	\$8,665	
Amherst, Town of	1 Family Residential	NO	X	2	\$3,246	\$1,623	
Amherst, Town of	1 Family Residential	YES	X	2	\$25,645	\$12,823	
Amherst, Town of	1 Family Residential	YES	X	2	\$3,630	\$1,815	
Amherst, Town of	1 Family Residential	YES	X	2	\$7,087	\$3,544	
Angola, Village of	1 Family Residential	NO		2	\$27,946	\$13,973	
Aurora, Town of	1 Family Residential	NO	X	2	\$6,921	\$3,460	
Aurora, Town of	2 Family Residential	NO	X	5	\$78,756	\$15,751	V
Blasdell, Village of	Det row bldg	NO	X	4	\$49,018	\$12,255	
Boston, Town of	1 Family Residential	NO	UTD	3	\$12,912	\$4,304	
Boston, Town of	1 Family Residential	NO	X	4	\$22,531	\$5,633	
Buffalo, City of	Spec. school	NO	AE	3	\$6,050	\$2,017	
Buffalo, City of	Res vac land	NO	X	5	\$90,408	\$18,082	V
Buffalo, City of	1 Family Residential	NO	AE	8	\$91,251	\$11,406	V
Buffalo, City of	Com vac w/imp	NO	AE	2	\$50,980	\$25,490	
Buffalo, City of	UTD	NO	A	3	\$30,567	\$10,189	
Buffalo, City of	Res vac land	NO	AE	2	\$3,350	\$1,675	
Buffalo, City of	Res vac land	NO	X	2	\$13,110	\$6,555	PU
Buffalo, City of	Res vac land	NO	UTD	4	\$32,043	\$8,011	
Buffalo, City of	1 Family Res	NO	UTD	2	\$7,230	\$3,615	
Buffalo, City of	2 Family Res	NO	X	2	\$6,857	\$3,429	
Buffalo, City of	UTD	NO	X	2	\$50,003	\$25,001	
Buffalo, City of	1 Family Res	NO	X	2	\$3,807	\$1,904	
Buffalo, City of	Res vac land	NO	A	2	\$5,279	\$2,640	
Buffalo, City of	UTD	NO	X	2	\$24,190	\$12,095	
Cheektowaga, Town of	UTD	NO	X	3	\$70,822	\$23,607	
Cheektowaga, Town of	1 Family Res	YES	500X	2	\$9,254	\$4,627	
Cheektowaga, Town of	2 Family Res	YES	X	3	\$6,161	\$2,054	
Cheektowaga, Town of	1 Family Res	NO	AE	2	\$9,586	\$4,793	
Cheektowaga, Town of	Restaurant	YES	X	4	\$269,100	\$67,275	
Cheektowaga, Town of	Apartment	NO	AE	2	\$93,827	\$46,914	
Cheektowaga, Town of	Office bldg.	NO	X	2	\$12,978	\$6,489	
Clarence, Town of	1 Family Res	NO	X	2	\$5,573	\$2,786	
Clarence, Town of	Restaurant	NO	X	2	\$76,364	\$38,182	
Clarence, Town of	Office bldg.	NO	X	2	\$38,781	\$19,391	
Concord, Town of	Seasonal res	NO	X	2	\$8,542	\$4,271	
Concord, Town of	1 Family Res	NO	X	2	\$44,516	\$22,258	
Depew, Village of	1 Family Res	NO	X	3	\$8,679	\$2,893	
Depew, Village of	1 Family Res	NO	X	2	\$13,125	\$6,562	
East Aurora, Village of	UTD	NO	X	2	\$3,205	\$1,603	
Eden, Town of	UTD	NO	X	2	\$9,523	\$4,762	

SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

Table 3a.13
NFIP Repetitive Loss Properties in Erie County
(Source: FEMA Region 2)

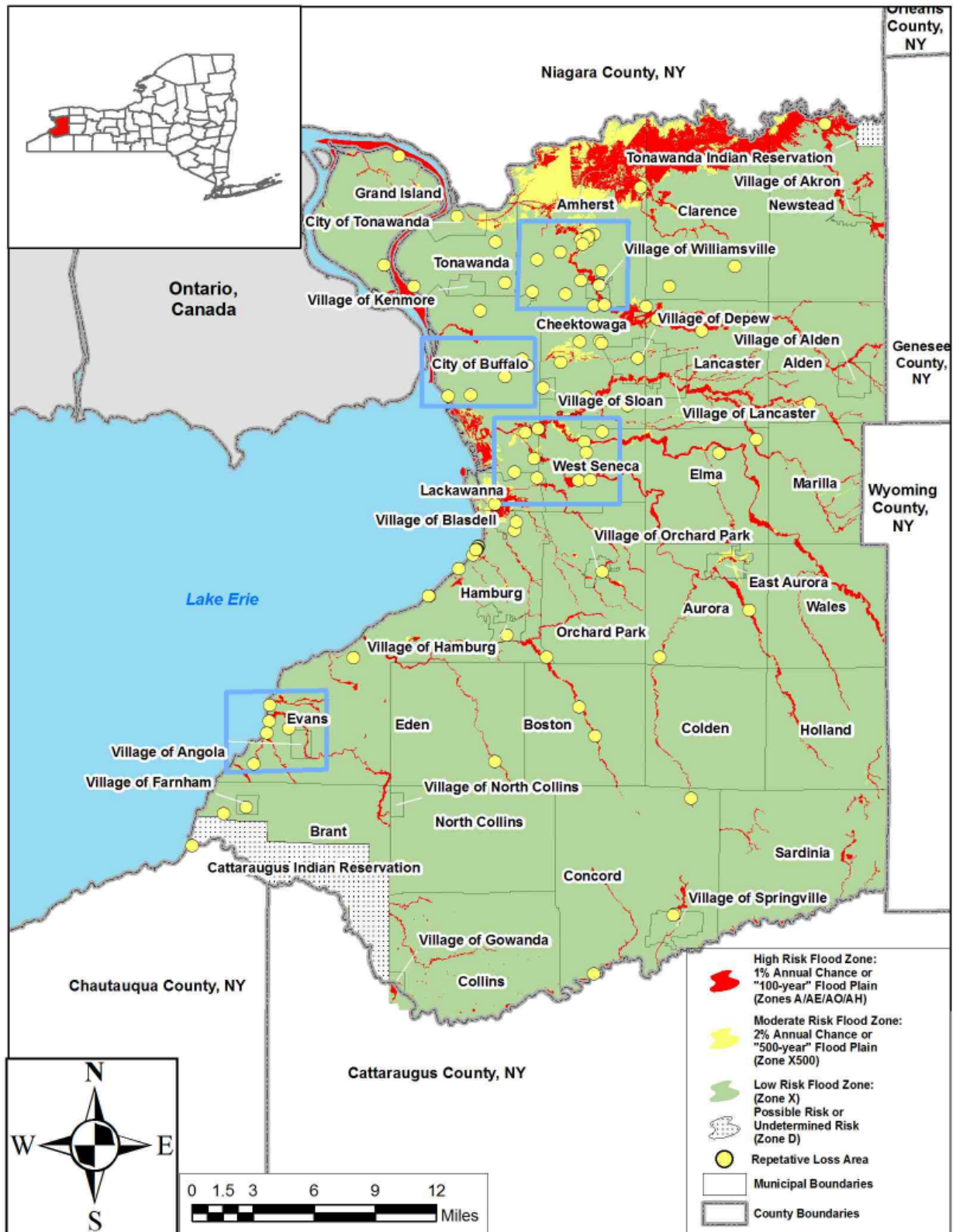
Municipality	Property Type *	Mitigated?	Flood Hazard Zone *	Number of Losses	Total Paid Losses	Average Paid Loss	SRL Indicator **
Elma, Town of	1 Family Res	NO	X	2	\$3,442	\$1,721	
Elma, Town of	1 Family Res	NO	X	3	\$9,947	\$3,316	
Elma, Town of	Rural res	NO	X	2	\$6,234	\$3,117	
Elma, Town of	UTD	YES	X	2	\$6,471	\$3,236	
Evans, Town of	1 Family Res	NO	X	3	\$16,277	\$5,426	PU
Evans, Town of	Seasonal res	NO	X	5	\$77,990	\$15,598	
Evans, Town of	UTD	NO	X	4	\$52,717	\$13,179	V
Evans, Town of	1 Family Res	NO	X	2	\$26,424	\$13,212	
Evans, Town of	Det row bldg	NO	UTD	2	\$7,382	\$3,691	
Evans, Town of	Apartment	NO	X	3	\$26,065	\$8,688	
Farnham, Village of	Converted Res	NO	X	2	\$43,500	\$21,750	PU
Grand Island, Town of	1 Family Res	NO	X	2	\$8,761	\$4,381	
Grand Island, Town of	1 Family Res	NO	UTD	2	\$4,937	\$2,469	
Grand Island, Town of	1 Family Res	NO	X	3	\$6,751	\$2,250	
Hamburg, Town of	Rural vac>10	NO	AE	4	\$58,440	\$14,610	
Hamburg, Town of	Rural vac>10	NO	X	2	\$21,030	\$10,515	
Hamburg, Town of	Rural vac>10	NO	AE	2	\$7,301	\$3,650	
Hamburg, Town of	Rural vac>10	NO	AE	2	\$37,622	\$18,811	
Hamburg, Town of	Rural vac>10	NO	A	6	\$155,403	\$25,900	V
Hamburg, Town of	Rural vac>10	NO	AE	2	\$6,664	\$3,332	
Hamburg, Town of	Rural vac>10	NO	X	4	\$23,709	\$5,927	
Hamburg, Town of	Rural vac>10	NO	UTD	2	\$35,731	\$17,865	
Hamburg, Town of	Rural vac>10	NO	UTD	2	\$13,885	\$6,942	
Hamburg, Town of	Rural vac>10	NO	X	2	\$48,941	\$24,470	
Hamburg, Town of	Rural vac>10	NO	X	2	\$49,675	\$24,838	
Hamburg, Town of	Rural vac>10	NO	X	2	\$14,666	\$7,333	
Hamburg, Town of	Rural vac>10	NO	A	2	\$22,258	\$11,129	
Hamburg, Town of	Rural vac>10	NO	X	2	\$25,993	\$12,996	
Hamburg, Town of	Rural vac>10	NO	X	2	\$68,048	\$34,024	PU
Hamburg, Town of	Rural vac>10	NO	500X	2	\$28,013	\$14,006	
Hamburg, Town of	Large retail	NO	X	2	\$23,821	\$11,910	
Hamburg, Town of	3 Family Res	NO	AE	2	\$43,553	\$21,776	
Hamburg, Town of	UTD	NO	X	3	\$38,970	\$12,990	
Hamburg, Town of	Multiple res	NO	AE	2	\$2,983	\$1,491	
Hamburg, Town of	Vac w/imprv	NO	X	2	\$7,197	\$3,598	
Hamburg, Village of	Dealer-prod.	NO	X	2	\$13,759	\$6,879	
Hamburg, Village of	UTD	YES	X	2	\$71,556	\$35,778	
Lackawanna, City of	MiniWhseSelfSto	YES	X	2	\$7,954	\$3,977	
Lackawanna, City of	1 Family Res	NO	X	2	\$5,739	\$2,869	
Lancaster, Town of	1 Family Res	NO	X	2	\$2,940	\$1,470	
Lancaster, Town of	1 Family Res	NO	X	3	\$5,555	\$1,852	
Lancaster, Town of	Res vac land	NO	X	4	\$98,875	\$24,719	VN
Newstead, Town of	Horse farm	NO	X	2	\$16,464	\$8,232	
Orchard Park, Village of	1 Family Res	NO	X	2	\$27,603	\$13,802	
Sloan, Village of	1 Family Res	NO	X	2	\$6,673	\$3,337	
Springville, Village of	UTD	NO	X	2	\$7,572	\$3,786	
Springville, Village of	UTD	NO	X	3	\$13,562	\$4,521	

Table 3a.13
NFIP Repetitive Loss Properties in Erie County
(Source: FEMA Region 2)

Municipality	Property Type *	Mitigated?	Flood Hazard Zone *	Number of Losses	Total Paid Losses	Average Paid Loss	SRL Indicator **
Tonawanda, City of	2 Family Res	NO	X	2	\$12,442	\$6,221	PU
Tonawanda, Town of	1 Family Res	NO	X	2	\$3,087	\$1,544	
Tonawanda, Town of	1 Family Res	NO	X	3	\$11,561	\$3,854	
Tonawanda, Town of	Marina	NO	X	3	\$12,116	\$4,039	
West Seneca, Town of	Warehouse	NO	X	2	\$7,693	\$3,846	
West Seneca, Town of	1 Family Res	NO	UTD	2	\$8,778	\$4,389	
West Seneca, Town of	Apartment	NO	X	2	\$10,752	\$5,376	
West Seneca, Town of	1 Family Res	NO	X	2	\$21,767	\$10,884	
West Seneca, Town of	1 Family Res	NO	X	2	\$34,408	\$17,204	
West Seneca, Town of	1 Family Res	NO	UTD	2	\$16,066	\$8,033	
Totals, 112 RLPs County-wide:				276	\$3,049,220	\$10,305	
<p>* UTD = Unable To Determine. Only 99 of the Repetitive Loss Properties could be address-matched with their parcel data using GIS and therefore some property types and flood hazard zones could not be determined.</p> <p>** SRL Indicator Key: V=Validated, VN=Validated Non-Residential, PU=Pending Uninsured</p>							

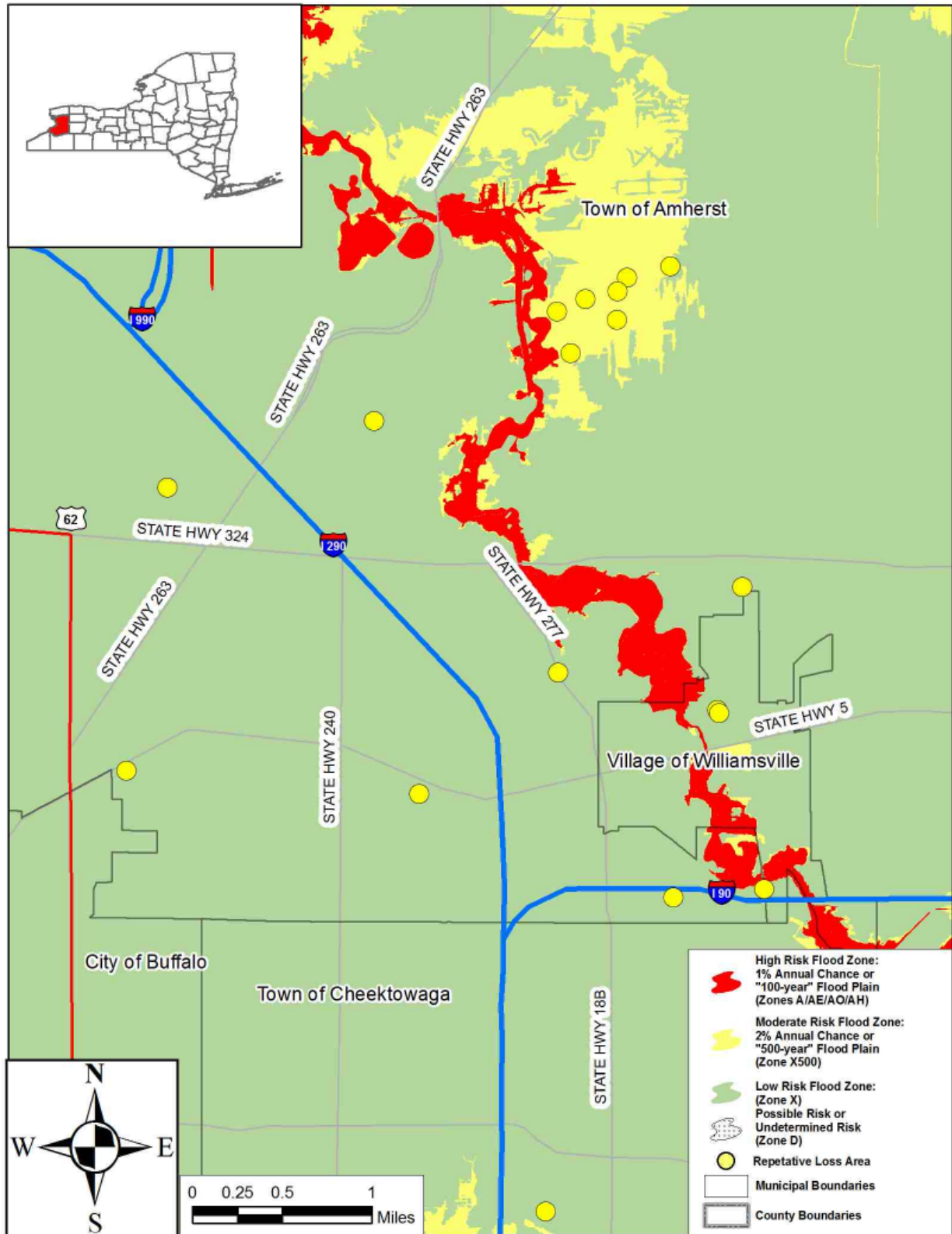
The average repetitive loss property in Erie County has experienced 2.46 loss events, with an average paid claim of approximately \$10,305 each event. The Repetitive Loss Property data suggests that approximately thirty percent of all the NFIP payments in Erie County may be attributable to just three percent of insured properties in the County (depending on how many of these properties remain insured by the NFIP). **Figures 3a.12 through 16** are intended to illustrate the general extent of areas in which RL properties are particularly concentrated, to act as pointers to areas where flooding of structures may be the most severe. It is possible that in these areas there also exist other properties that suffer significantly from flooding but, for a variety of possible reasons do not meet RL criteria or have not participated in the NFIP, and which may also benefit from mitigation actions.

Figure 3a.12: Erie County NFIP Repetitive Loss Areas



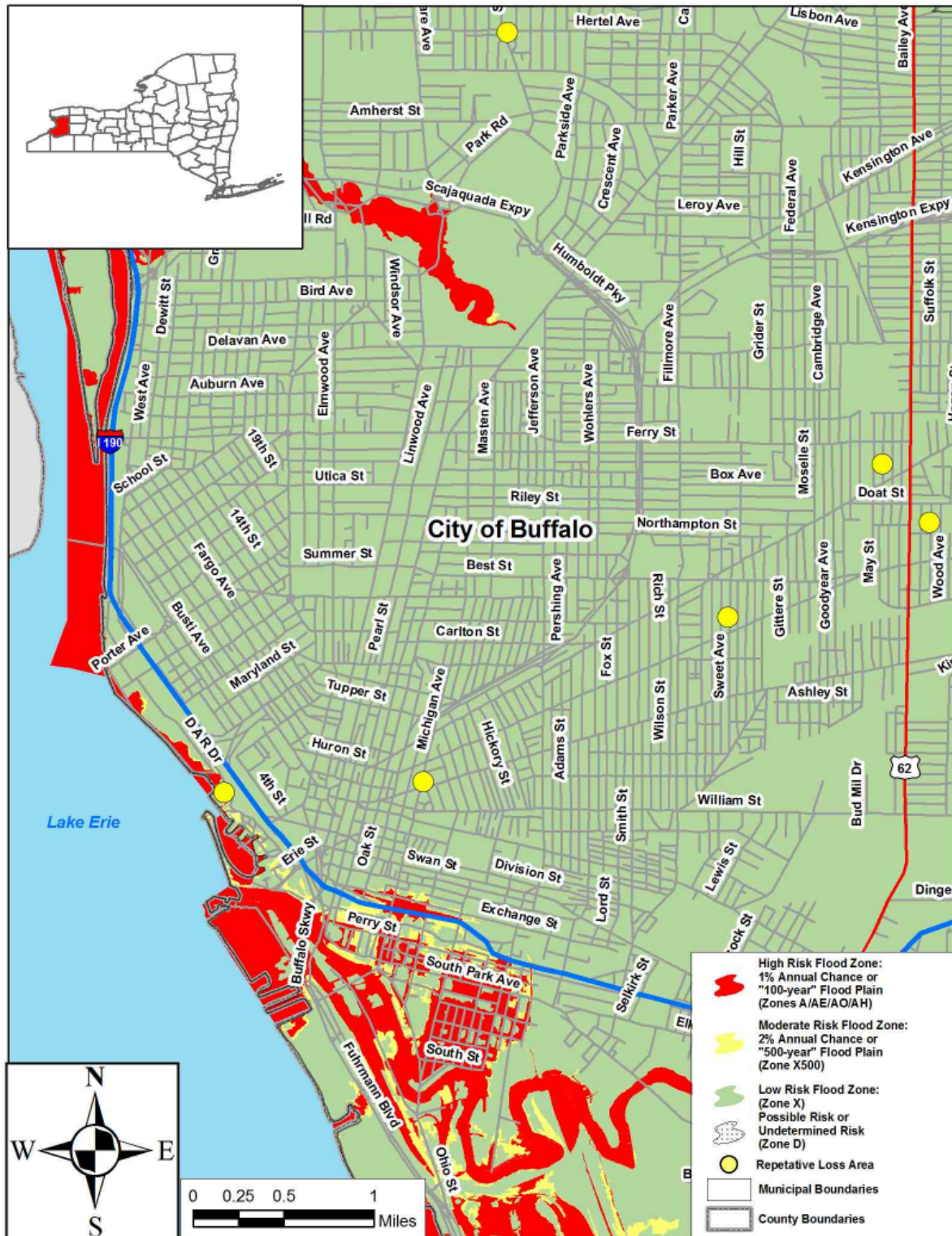
SOURCE: ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, FEMA, Preliminary DFIRM Flood Data, 2009.

Figure 3a.13: NFIP Repetitive Loss Areas – Town of Amherst



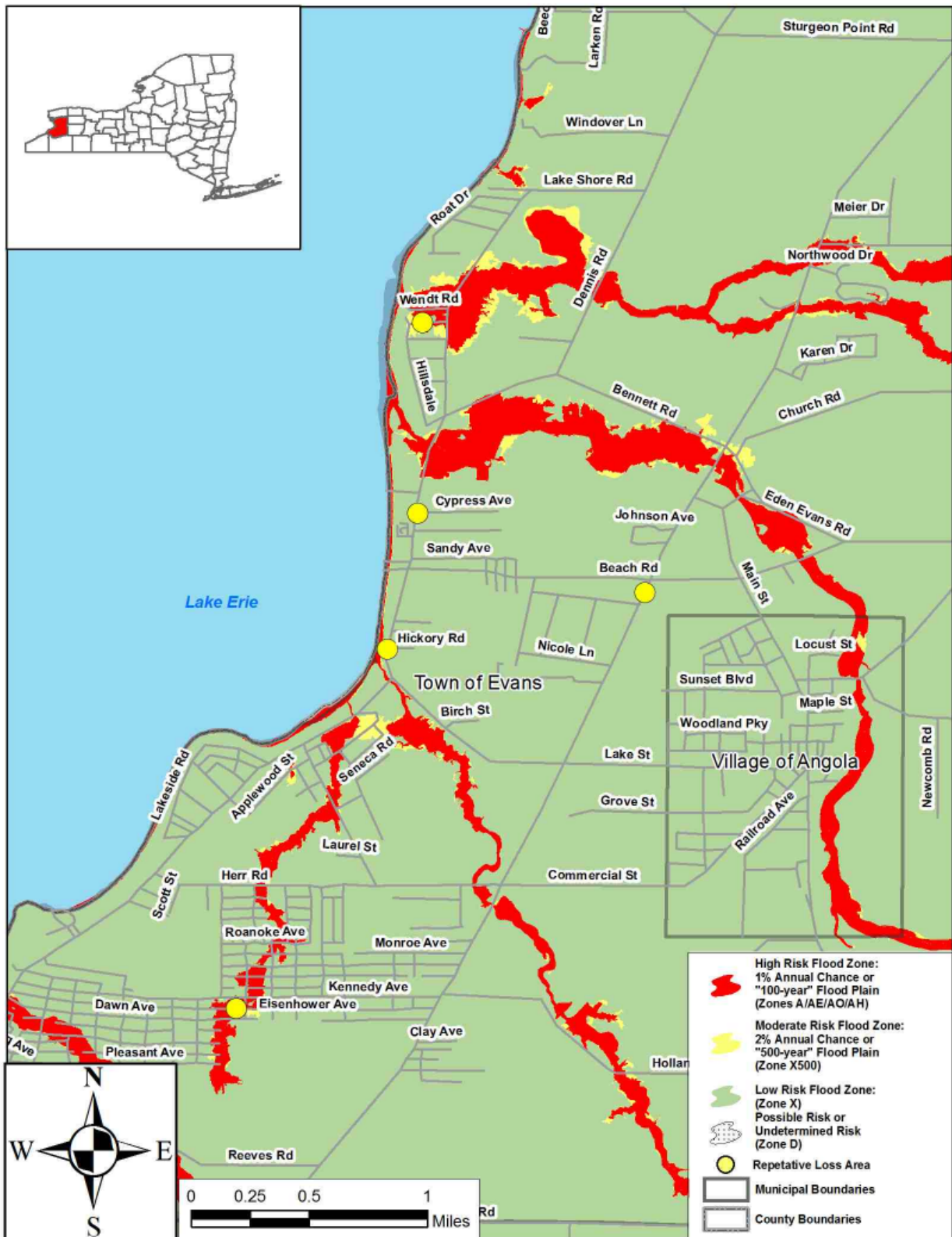
SOURCE: ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, FEMA, Preliminary DFIRM Flood Data, 2009.

Figure 3a.14: NFIP Repetitive Loss Areas – City of Buffalo



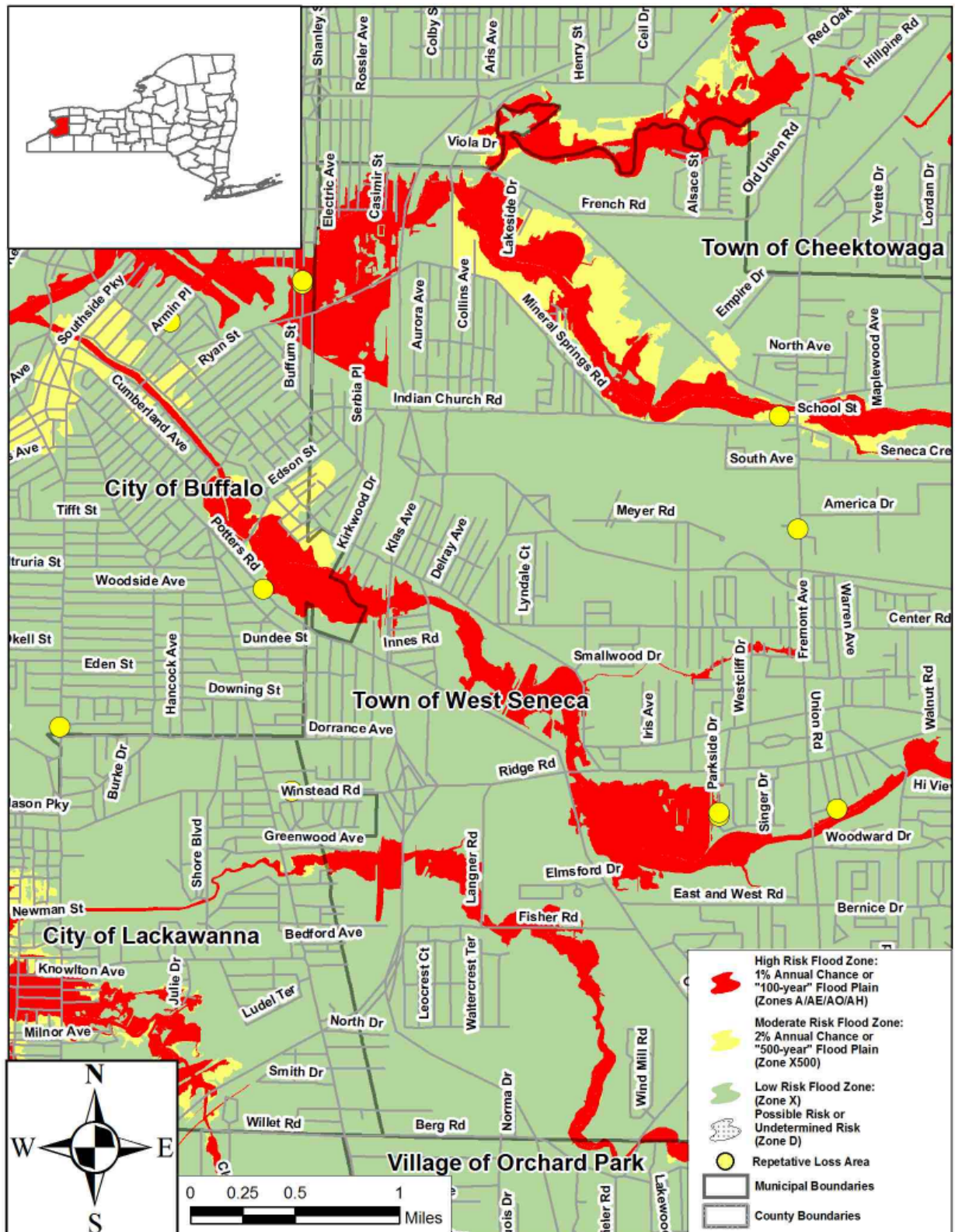
SOURCE: ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, FEMA, Preliminary DFIRM Flood Data, 2009.

Figure 3a.15: NFIP Repetitive Loss Areas – Town of Evans



SOURCE: ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, FEMA, Preliminary DFIRM Flood Data, 2009.

Figure 3a.16: NFIP Repetitive Loss Areas – Town of West Seneca



SOURCE: ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, FEMA, Preliminary DFIRM Flood Data, 2009.

Historic Occurrences – Floods

Floods have occurred in Erie County's communities in the past, and will continue to do so in the future. The FEMA Flood Insurance Study for Erie County notes that flooding can occur in Erie County during any season of the year, but it most likely occurs in the late winter to early spring months when melting snow may combine with intense rainfall to produce increased runoff. Ice jams and debris have often increased flood heights by impeding water flow at bridges and culverts. Floods can result from collusion over the watershed of a large mass of warm moisture-laden air from the north; from sharp rises in temperature in the spring that melt the snow cover of the basin and are followed by rains; and from localized thunderstorms.

Flood Disaster and Emergency Declarations. The New York State Emergency Management Office reports Erie County as having been affected by six Presidential Disaster Declarations related to flooding from 1953 to 2011, as detailed in **Table 3a.14**. Erie County is not listed by FEMA or the New York State Office of Emergency Management as having been affected by any separate Emergency Declarations involving flooding over the same period.

Through the Public Assistance (PA) Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The Individual Assistance Program (IA) provides money or direct assistance to individuals, families and businesses in an area whose property has been damaged or destroyed and whose losses are not covered by insurance. It is meant to assist with critical expenses that cannot be covered in other ways, rather than to restore damaged property to its condition before the disaster.

Disaster #	Description	Declaration Date	Eligible Assistance
1857	Severe Storms and Flooding	September 1, 2009	PA and IA
1665	Severe Storms and Flooding	October 24, 2006	PA and IA
1534	Severe Storms and Flooding	August 3, 2004	PA only
1335	Severe Storms and Flooding	July 21, 2000	PA only
1233	Severe Storms and Flooding	July 7, 1998	PA and IA
734	Snow Melt, Ice Jams	March 22, 1985	PA only
494	Ice Storm, Severe Storms and Flooding	March 19, 1976	PA and IA

The NCDC database records flood events in Erie County from 1994 (when detailed NCDC records begin in this area) to 2011, and there have been 82 significant recorded flood events affecting the County in this period, causing reported property damages totaling more than \$24 million and approximately \$650 thousand in crop damages, including some damages incurred outside Erie County. Thirty of these events and approximately \$16.6 million in damages are attributed to events since 2005 – and \$15 million alone is from the single event on August 9, 2009 in the Village of Gowanda and surrounding areas. **Table 3a.15** presents selected significant flood events recorded for the County in the NCDC database for which some detailed information was available, supplemented with information in the FEMA FIS and web site. In addition, the Village of Gowanda provided information on the August 2009 flood event.

Table 3a.15
Selected Significant Flood Events in Erie County
(Source: NOAA NCDC, FEMA FIS and web site, Core Planning Group)

Date	Affected Municipalities	Description	Reported Damage*
8/27/94	Various	Three to four inches of rain fell in less than an hour over the towns of Boston and Eden. The flood waters swamped yards and basements and washed out roads, culverts and crops.	\$500,000 property damage; \$50,000 crop damage
Jan. 1996	Various	Warm temperatures and rapid snowmelt of 8 to 12 inches of snow combined with heavy rainfall produced significant flooding and ice jams. Nearly two hundred homes were damaged by flood waters. In West Seneca, over three feet of water and ice covered some sections of Clinton and Transit Roads. Evacuations occurred and several roads were closed due to the flood waters in West Seneca and Elma.	\$1.7 million property damage; \$500,000 crop damage
Sept. 1996	Tonawanda	Storm sewers and drains could not handle the runoff forcing the closure of over 30 streets and resulting in serious basement flooding in thousands of homes. Thousands of homes lost both their natural gas and their power.	\$400,000 property damage
7/8/98	Various	The extensive flooding closed numerous roads throughout the multi-county area. Several were completely washed out. Specific road closures included: Rte.78 in Depew, Rte.98 in Arcade, Four Rod and Old Three Rod Roads in Alden, Rte.63 in Dansville, and Rte.20 in Darien.	\$1.9 million property damage; \$100,000 crop damage
Jan. 1999	Various	Ice jam flooding occurred on area Buffalo area creeks. Some evacuations were necessary and roads were closed in the vicinity of south Cheektowaga. Some of the hardest hit areas included Lancaster and Williamsville in Erie County. Evacuations occurred in Angola, Chili and Lancaster.	\$740,000 property damage
9/23/00	Blasdell	A State of Emergency was declared in Blasdell. Roads were washed out and basements flooded throughout the southtowns. The heavy rains caused three area creeks to overflow their banks.	\$400,000 property damage
12/20/00	Lake Erie coastline (notably Buffalo)	SEICHE. High winds at the eastern end of Lake Erie caused the water to rise above five feet in a few hours. High water levels, along with ten to 14 foot waves, caused shoreline erosion and local flooding. Evacuations were ordered at Hoover Beach. The lake remained above flood stage for a few hours. There were no reports of injuries or fatalities.	\$50,000
03/09/02	Lake Erie coastline (notably Angola)	SEICHE. Winds above 50 knots on Lake Erie caused the lake level to rise at the eastern end of the lake. The lake exceeded the eight foot flood stage and peaked at 9 feet 63 inches at 2340 hours. No injuries or fatalities occurred. Evacuations were not ordered.	\$35,000
May-June 2004	Not specified	Federal Disaster Declaration for Severe Storms and flooding between May 13 th and June 17 th resulted in a PA-only declaration for 14 New York Counties. Erie County was included in this declaration. (Neither the NOAA NCDC database nor the SHELUDS database includes this event period in its event history for Erie County.)	FEMA reports \$18.7 million in PA payouts across the 14 effected counties.
11/06/05	Not specified	SEICHE. High water levels and waves of ten to fifteen feet resulted in some erosion of the lake shore and limited property damage. Several roads along the lake shore were water covered or closed because of spray.	\$25,000
12/01/06	Not specified	SEICHE. Along the Lake Erie Shore, the water levels at the eastern end of the lake fell several feet ahead of the storm, then quickly surged as the winds shifted with the passage of the cold front. The lake level rose over ten-and-a-half feet in a matter of hours, peaking at 9.93 feet at the lake level gage at Buffalo.	\$10,000
01/30/08	Buffalo	SEICHE. The high water levels and waves to twelve to sixteen feet resulted in erosion of the lake shore and significant flooding at the extreme eastern end of the lake. The FEMA FIS reports that this unnamed storm had sustained winds of 30 to 40 mph and gusts to 60 mph. Coastal flooding occurred in several areas in the City of Buffalo, with high water marks ranging from about 578 to 580 feet.	\$50,000

Table 3a.15 Selected Significant Flood Events in Erie County <i>(Source: NOAA NCDC, FEMA FIS and web site, Core Planning Group)</i>			
Date	Affected Municipalities	Description	Reported Damage*
Dec. 27-28, 2008	West Seneca, Marilla, Elma, Lancaster, Buffalo	SEICHE. The combination of the wind shift, rapid strengthening of the wind speed and the long fetch up the length of Lake Erie produced a seiche on the lake. Water levels rose over six and a half feet in about three hours' time. In addition, flooding was reported in West Seneca and near Cazenovia Park in South Buffalo. Cayuga Creek at Lancaster crested above its flood stage at 9.23 feet at 6 p.m. on the 27th. Flooding was reported in Marilla, Alden and Lancaster. Flooding occurred in Elma and Gardenville.	\$275,000 property damage (with \$25,000 attributed specifically to seiche)
08/09/09	Village of Gowanda	Devastating storms struck the southern area of Erie County, particularly in the Village of Gowanda, where caused extensive building and infrastructure damage occurred. This event received a Federal disaster declaration, and was the highest flow on record for the Cattaraugus Creek gage #04213500 at Gowanda. The Village estimates that nearly \$5 million in damages were incurred to Village-owned facilities and infrastructure, including damages to the Village Hall (\$534,677), DPW Building (\$146,675), Village roads (\$1,142,882), Village Water Department (\$1,388,475), debris removal (\$651,767), creek bank erosion repairs (\$611,123), and wastewater treatment plant repairs (\$121,232). The FEMA FIS also reports that the New York and Lake Erie Railroad was temporarily suspended due to a washout of track.	More than \$15 million
12/09/09	Not specified	SEICHE. The combination of the wind shift, rapid strengthening of the wind speed and the long fetch up the length of Lake Erie produced a seiche on the lake. Water levels rose over six feet in just a few hours.	\$15,000

*May include damage incurred outside Erie County

The SHELDUS database lists a total of 91 flood events causing damage in Erie County since April 1960 to which more than \$24 million in property damages and \$1.3 million in crop damages was attributed. Since the SHELDUS database does not provide descriptions or locations of the impacts of individual events, the NCDC descriptions above will suffice to illustrate the effects of flooding in Erie County, and the SHELDUS data has been primarily used in the estimation of potential damages arising due to floods in Section 3c. **Appendix L** includes information from the FEMA FIS documenting historic flood events and flood protection measures in Erie County on a municipality-specific basis.

Probability of Occurrence – Floods

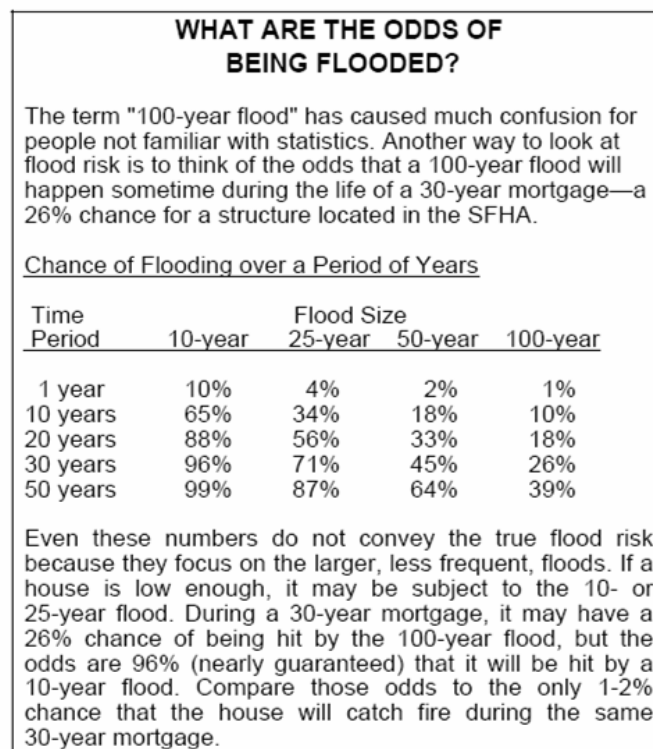
The Erie County HAZNY notes that flooding occurs regularly in Erie County. The probability of occurrence of a flood at a given location (the odds of being flooded) is expressed in percentages as the chance of a flood of a specific magnitude occurring in any given year. The “100-year flood” has a 1 percent chance of occurring in any given year. The 100-year flood is often also referred to as the “base flood”. This probability of occurrence might imply that a 100-year flood would reoccur only once every 100 years; in reality, this is not the case. A 100-year flood can happen multiple times in a single year, or not at all for more than 100 years. Properties located in FEMA-mapped A- and V-Zones are within the footprint of the 100-year floodplain. FEMA A-Zones represent the 100-year floodplain.

For all floodplains, there is an associated water surface elevation. This elevation is unique to any given location on the map (in other words, 100-year flood levels vary from one community to the next throughout Erie County, and also within individual communities).

Within the 100-year floodplain, flooding can occur at less than the 100-year flood level, and also more than the 100-year flood level. The 100-year flood represents a flood of high magnitude – it is a deep and widespread event. The 500-year flood is of a greater magnitude, and would be deeper and more widespread than a 100-year event. However, it is not as likely to occur. Smaller floods, with magnitudes of 10-years or 50-years for example, are also possible within the 100-year floodplain. These are not as deep or as widespread as a 100-year flood would be, however, they are much more likely to occur.

The term “100-year flood” can often be confusing to someone not intimately familiar with flooding or statistics. FEMA’s *NFIP Floodplain Management Requirements: a Study Guide and Desk Reference for Local Officials* (FEMA-480), suggests that another way to look at flood risk is to think of the odds that a 100-year flood will happen sometime during the life of a 30-year mortgage of a home in the floodplain. **Figure 3a.17** illustrates these odds, over various time periods for different size floods. In any given year, a property in the 100-year floodplain has a 10 percent chance of being flooded by a 10-year flood, and a 1 percent chance of being flooded by a 100-year flood. This may not sound particularly risky at first glance. However, over a 30-year period, that same location has a 96 percent chance of being flooded by a 10-year flood and a 26 percent chance of being flooded by a 100-year flood.

Figure 3a.17: Odds of Being Flooded



Ice Jams

Description

Ice jams form when ice floating downstream in a river stalls and begins to build into a jam, forming a dam. The “reservoir” behind the dam quickly fills with water until out of bank flooding occurs. The observed effect can be very similar to flash flooding, and sudden flooding downstream may be caused by the sudden failure or release of the ice jam. Ice jams generally form at locations where the ice transport

downstream is reduced by an obstruction or a significant hydrologic change. Natural obstructions in the river can include bends, intact sheet ice cover, or a decrease in channel slope. Man-made obstructions can include bridges, existing dams, waterline crossings, and other constructions in the channel.

Ice jams and resulting floods can occur during fall freeze-up from the formation of frazil ice (a collection of loose, randomly oriented needle-shaped ice crystals) during midwinter periods when stream channels freeze solid forming anchor ice, and during spring breakup when rising water levels from snowmelt or rainfall break existing ice cover into large floating masses that lodge at bridges or other constructions. Damage from ice jam flooding may exceed that caused by open water flooding – flood elevations are usually higher than predicted for free-flow conditions and water levels may change rapidly. During cold weather, there is a reduction in evapotranspiration, infiltration (due to frozen ground) and surface storage, (due to the filling of ground depressions with snow and ice), which result in more water being delivered to the channel. Therefore for equal amounts of total available water during cold and warm seasons, the amount of excess water available for runoff will be greater during the cold season. Additional damage may be caused by the force of floating ice colliding with buildings, other structures, and automobiles.

Location – Ice Jams

The identification of particular areas prone to ice jam flooding is difficult since the hazard is usually unpredictable and can be extremely localized. However, available research and historic data suggests that ice jam flood hazard is most common in areas of flat terrain where the climate included extended periods of temperature below zero. Ice jams are very common in the north east United States, and according to data from the USACE Cold Region Research and Engineering Laboratory (USACE CRREL), 1,442 ice jam events have been recorded in New York State between 1867 and 2008, a number exceeded only by the State of Montana.

Figure 3a.17 shows the locations of ice jam incidents that have been recorded by the CRREL in New York State from 1875 to 2007. Multiple instances of ice jams may be associated with a single point location. This figure identifies numerous locations in Erie County where ice jams have been recorded.

Extent – Ice Jams

Accumulated winter precipitation determines the magnitude of the spring runoff, which controls the severity of breakup and associated ice-jam flooding at any particular point in time. The ice jam hazard overall is considered to be of moderately low severity⁵ in Erie County due to the fact that it affects a small region, allows several days warning time, and is documented to occur regularly. Damages tend to be localized and moderate; however, depending on the magnitude of the ice jam, major damages and losses can result (such as damaged roads, bridges, buildings, and homes). Impacts from ice jams tend to primarily affect areas located along rivers, tributaries or reservoirs. Serious injury or death is unlikely. The hazard duration is typically two to three days, with a recovery time of one to two weeks. When ice jam events take place, typically, flooding occurs within the localized area of the event as a result.

Historic Occurrences – Ice Jams

The USACE CRREL Ice Jams Database records 118 ice jam incidents in total on all watercourses in Erie County over the 82 year period between 1929 and 2011. The available descriptions of the impacts of a subset of some recent incidents are presented following **Figure 3a.18**.

⁵ As per Erie County HAZNY, prepared by ECDES in October 2010.

January 18-19, 1996. According to a NWS Flood Statement on 1/18/96, an ice jam formed on Buffalo Creek between Borden and Transit Streets in West Seneca, NY. Borden Street, Transit Street, and Clinton Road were closed due to flooding caused by the mile long ice jam. At about 7PM on 1/18/96 the jam broke and started moving rapidly downstream. Flood waters began to recede after the jam broke. Rapid snowmelt of eight to 12 inches of snow and heavy rainfall of about an inch combined with warm temperatures to produce a major ice jam on the Buffalo Creek in West Seneca. Over three feet of water and ice covered some sections of Clinton and Transit Roads. Evacuations occurred and several roads were closed due to the flood waters in West Seneca and Elma. Nearly two hundred homes were damaged by flood waters. \$1.7 million in property damages and \$500,000 in crop damages were reported for this event (NOAA NCDC). On 2/9/96 the jam was located between Union and Harlem Rds. It extended from the Black Railroad bridge near Brookview Apartments on Indian Church Rd to just west of Borden Rd. Backyard flooding resulted. A portion of the jam broke at the Black Railroad bridge on 2/10/96. The next day the jam was located just downstream of Union Rd. The water level continued to rise on the river at Union Rd through 2/21/96. Warm temperatures and rain were thought to possibly loosen the jam on 2/23. Jim Lever, CECRL-IE, was at the site of the jam on 2/22/96. He reported that the jam had heavily flooded a strawberry field near Clinton St and Transit Rd. On 2/23/96 it was believed that warm temps and rain might loosen the jam. By 2/28/96 the jam had loosened and cleared and water levels were back to normal. A total of \$4500 in damages occurred in West Seneca due to the jams on Buffalo Creek and Cazenovia Creek.

January 23-24, 1999. Ice jam flooding was reported on Buffalo area creeks. Evacuations were necessary and roads were closed in south Cheektowaga. Some of the hardest hit areas included Lancaster and Williamsville. Evacuations also occurred in Angola, Chili and Lancaster. Property damages of \$740,000 were reported for this event (NOAA NCDC).

February 4, 2003. An ice jam formed on Cayuga Creek at Four Rod Road in Alden. Ice blocked the bridge and water overflowed. A flood warning was issued for Erie County.

March 2-3, 2004. The NWS reported a major ice jam on the Cazenovia Creek in the Buffalo, NY area near I-90. At least 2 road closures had been reported. At 555 PM, the NWS reported the ice jam on the Cazenovia Creek in South Buffalo broke and progressed downstream into Cazenovia Park resulting in a rapid rise in the creek level downstream into South Buffalo. The Stevenson Street Bridge was closed. The NWS reported that the last jam affecting the Buffalo area eroded by Friday morning, March 5th. The National Weather Service reported an ice jam on the Buffalo Creek near Elma, NY on March 3. The Buffalo Creek overflowed in the town of Elma, flooding the home of an Erie County elected official. During the overnight and into the early morning, several fire companies were in the town of Elma to hold back waters from the overflowing Buffalo Creek. It affected one home. Throughout the overnight, volunteer firefighters and officials from Erie County and the town of Elma checked the banks of the Buffalo Creek and nearby homes for possible flooding. About 7 miles to the south, the siren wailed at Sunset Bay warning residents to get their cars out, as the icy waters of Cattaraugus Creek spilled over its banks.

December 30, 2004. The National Weather Service reported an ice jam on Cazenovia Creek in Buffalo New York between the Stevenson Street Bridge and the Cazenovia Bridge. At 945 AM Friday December 31, the jam was causing water to back up into Cazenovia Park. At that time, no private homes were affected. About a half inch of rain had fallen since midnight, causing runoff from snowmelt that resulted in ice breakup, movement, and jamming. At 1 PM EST on December 31, 2004, the NWS reported that the jam remained in place but water was receding from Cazenovia Park. At 431 PM, the NWS cancelled the flood warning after flood waters receded from Cazenovia Park. USGS real-time stage information for Gage no. 04215500 (Cazenovia Creek at Ebenezer) showed that a jam had been in place at the gage between December 27 and very early in the morning of December 31. Stage records show a sudden drop in stage at 3:15 AM on December 31 typical of ice jam failure. (NOAA NCDC records for this event indicate only \$3,000 in property damages).

March 15, 2007. Ice on Cattaraugus Creek at Gowanda NY, broke up and has caused river levels to rise eight feet over a two day period, but appeared to have begun to recede midmorning 15 March. Warm temperatures during the past week, the resulting snowmelt, and a period of rain, led to the breakup of numerous rivers across New England, many causing flooding.

Of the 118 ice jam incidents recorded by CRREL, sixty-four percent of these events have occurred on the Cayuga Creek and Cazenovia Creek alone. In total, 38 events are recorded for Cazenovia Creek, 37 for Cayuga Creek, nine for Cattaraugus Creek, seven for the Niagara River, six for Buffalo Creek, five for Tannery Brook, four for Smoke Creek, four for the Buffalo River, three for Big Sister Creek, two for Ellicott Creek, and one for each of Muddy Creek, Clear Creek, and Buttermilk Creek.

The municipal locations for these 118 events are predominantly in Lancaster and West Seneca (35 events each). This is followed by Buffalo with 13, Gowanda with nine, Tonawanda with six, East Aurora with five, Evans and Lackawanna with four each, Elma with two; and Alden, Cheektowaga, Collins, Springville and Williamsville with one each.

The CPG notes that one third of the 49 floods/flash floods that occurred in Erie County between 1993 and 2002 were due to ice jams, and that more problematic areas include South Buffalo Cazenovia Park near the Stevenson Bridge, and areas in West Seneca where the creeks bend and turn rapidly as well as behind Southgate Plaza in West Seneca. Municipalities that experience ice jams check for problem areas frequently in the winter months. Once an ice jam is spotted it can often be easily cleared away to increase downstream flow. The USACE is undergoing some ice jam mitigation projects in Erie County.

Probability of Occurrence – Ice Jams

Due to the nature of the terrain and the climate in Erie County, ice jam events are essentially certain to occur in the future, although whether or not such events will cause significant damage is less easy to predict, since detailed records of actual damage caused by ice jams are scarce. The available data in the CRREL Ice Jam Database of 118 events over an 82 year period, or an average annual number of 1.4 events within the County. An associated number of damage-causing occurrences per year has not been computed, since only nine of the 118 event records have dollar damages reported. The probability of future ice jams in Erie County is, however, certain. And based on historic occurrences, they are most likely to occur on the Cazenovia and Cayuga Creeks. Lancaster and West Seneca are the two municipalities most likely to be impacted by ice jams, followed by the City of Buffalo.

Earthquakes

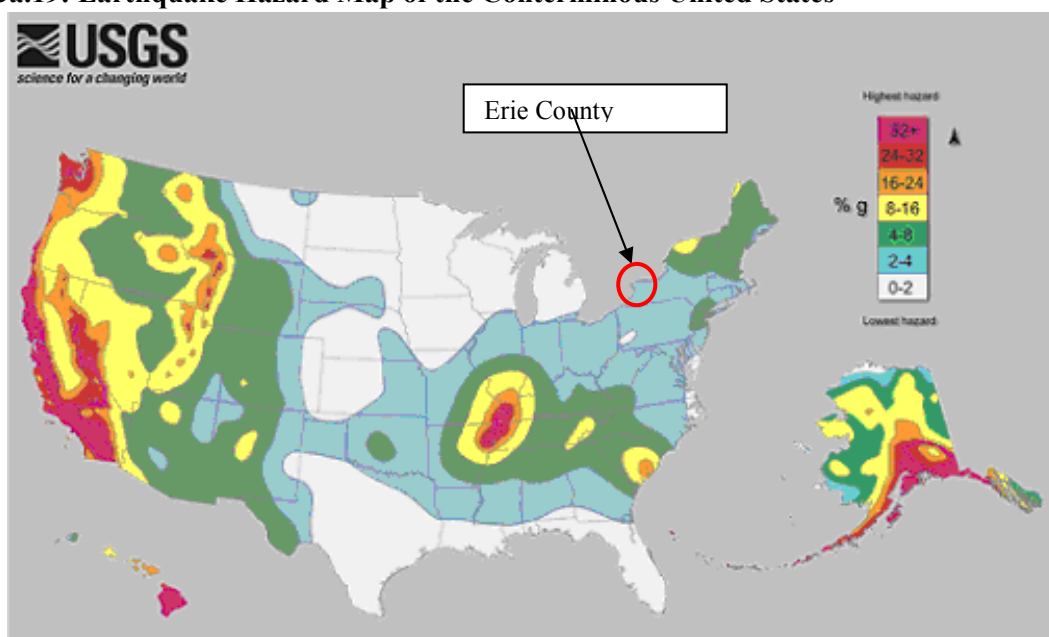
Location – Earthquakes

According to the USGS Earthquake Hazards Program, most earthquakes (approximately 90%) occur at the boundaries where the plates meet, although it is possible for earthquakes to occur entirely within plates. Erie County is significantly distant from any plate boundaries. Regardless of where they are centered, earthquakes can impact locations at – and well beyond – their point of origin. They are often accompanied by “aftershocks” – secondary quakes in the earthquake sequence. Aftershocks are typically smaller than the main shock, and can continue over a period of weeks, months, or years from the main shock. In addition to the effects of ground shaking, earthquakes can also cause landslides and liquefaction under certain conditions. Liquefaction occurs when unconsolidated, saturated soils exhibit fluid-like properties due to intense shaking and vibrations experienced during an earthquake. Together, ground shaking, landslides, and liquefaction can damage or destroy buildings, disrupt utilities (i.e., gas, electric, phone, water), and sometimes trigger fires.

Earthquakes may affect any of Erie County’s communities. **Figures 3a.19 and 3a.20** show the earthquake hazard maps for the conterminous United States and also New York State, which are prepared by the USGS Earthquake Hazards Program. It shows that the earthquake hazard in New York State is low

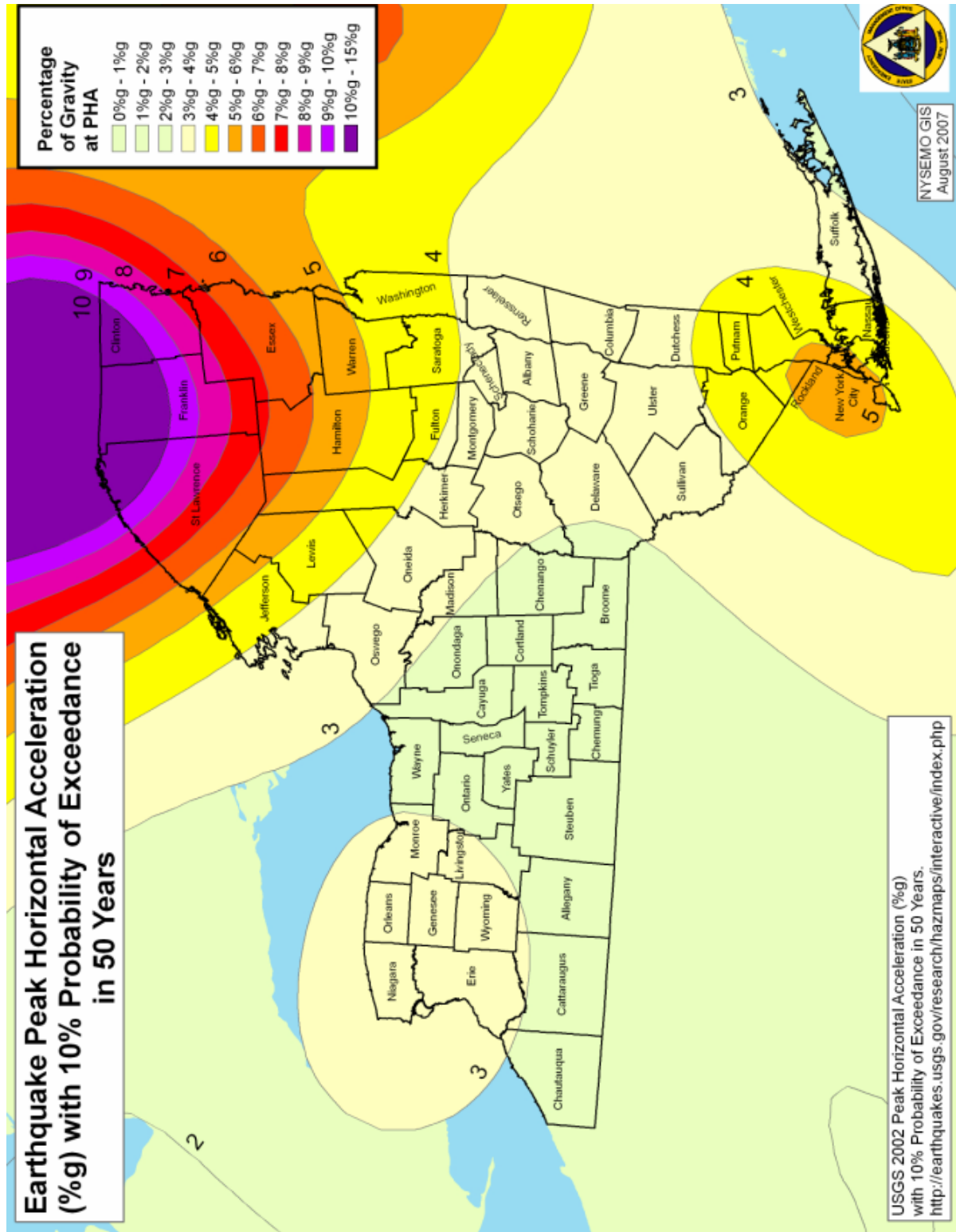
relative to other parts of the country (for example the west coast of the USA), but the possibility for noticeable earthquakes does exist in the State.

Figure 3a.19: Earthquake Hazard Map of the Conterminous United States



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Figure 3a.20: Earthquake Hazard Map of New York State



Extent – Earthquake

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (**Table 3a.16**). Each unit increase in magnitude on the Richter Scale corresponds to a 10-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, with a I corresponding to imperceptible (instrumental) events, IV corresponding to moderate (felt by people awake), to XII for catastrophic (total destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 3a.17**.

Table 3a.16 Richter Scale	
Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0-7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

Table 3a.17 Modified Mercalli Intensity Scale for Earthquakes			
Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	INSTRUMENTAL	Detected only on seismographs.	
II	FEEBLE	Some people feel it.	<4.2
III	SLIGHT	Felt by people resting; like a truck rumbling by.	
IV	MODERATE	Felt by people walking.	
V	SLIGHTLY STRONG	Sleepers awake; church bells ring.	<4.8
VI	STRONG	Trees sway; suspended objects swing, objects fall off shelves.	<5.4
VII	VERY STRONG	Mild alarm; walls crack; plaster falls.	<6.1
VIII	DESTRUCTIVE	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	RUINOUS	Some houses collapse; ground cracks; pipes break open.	<6.9
X	DISASTROUS	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	<7.3
XI	VERY DISASTROUS	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	<8.1
XII	CATASTROPHIC	Total destruction; trees fall; ground rises and falls in waves.	>8.1

Source: Federal Emergency Management Agency

An earthquake with a 10 percent chance of exceedance over 50 years in Erie County would have a PGA of 3 to 4%g and an intensity ranging from only IV to V, which would result in light to moderate perceived

shaking, and damages ranging from none to very light. For comparison purposes, an earthquake of intensity IV on the Modified Mercalli Scale would most likely cause vibrations similar to heavy trucks driving over roads, or the sensation of a jolt. Hanging objects would swing; standing cars would rock; windows, dishes and doors would rattle; and, in the upper ranges of intensity IV, wooden walls and frames would creak. An earthquake of intensity V on the Modified Mercalli Scale would be felt outdoors, awaken sleepers, disturb or spill liquids, displace small unstable objects, swing doors, and cause shutters and pictures to move. Less frequent earthquakes of high magnitude with much higher PGA's and, in turn, substantially higher damage potentials, are possible in Erie County - with return periods of 100 to 2500 years. As shown in Figure 3a.32, when soil type is taken into account, the PGAs with a 2% probability of exceedance in any given year ranges from 25 to 94, depending on location; this corresponds to very strong to violent perceived shaking and moderate to heavy damages.

As noted in the New York State Hazard Mitigation Plan, soil type can have an impact on the severity of an earthquake at a given location. For example, soft soils (i.e., fill, sand) are more likely to amplify ground motion during an earthquake. Liquefaction is also more likely to occur in areas of soft soils. In contrast, harder soils (i.e., granite) tend to reduce ground motion during an earthquake. **Figure 3a.21** shows soil types in five basic categories with varying degrees in likelihood of amplifying the effects of an earthquake, with Category A being far less likely to amplify the seismic motion than Category E. Areas of northern Erie County would experience an amplification of ground motion during seismic activity, according to NEHRP soil classifications.

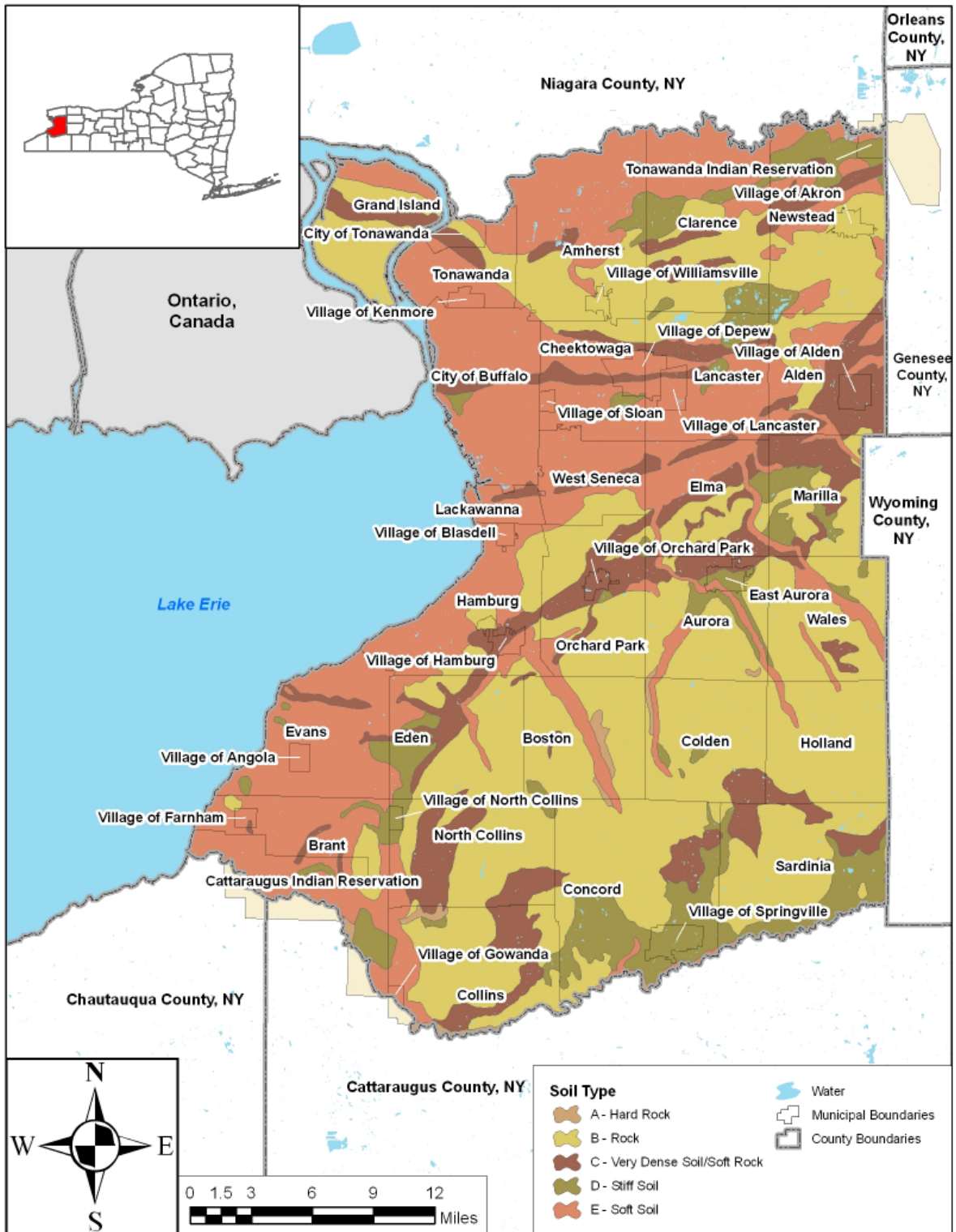
The soil types and surficial materials have been combined with the seismic hazards by the New York State Emergency Management office and the State Geological Survey in **Figure 3a.22** to provide an adjusted, more refined picture of the earthquake hazard in terms of earthquake spectral acceleration⁶, which is a more accurate indicator of damage to buildings, which in some areas of the state results in a significantly higher earthquake hazard than is evident from the simple mapping of **Figure 3a.20**.

The vast majority of the Erie County's most densely populated and developed areas are generally located in some of the highest earthquake risk bands designated in the NYSHMP.

A more detailed breakdown of parcels and property exposed to the earthquake hazard by land use types is presented in **Appendix A**.

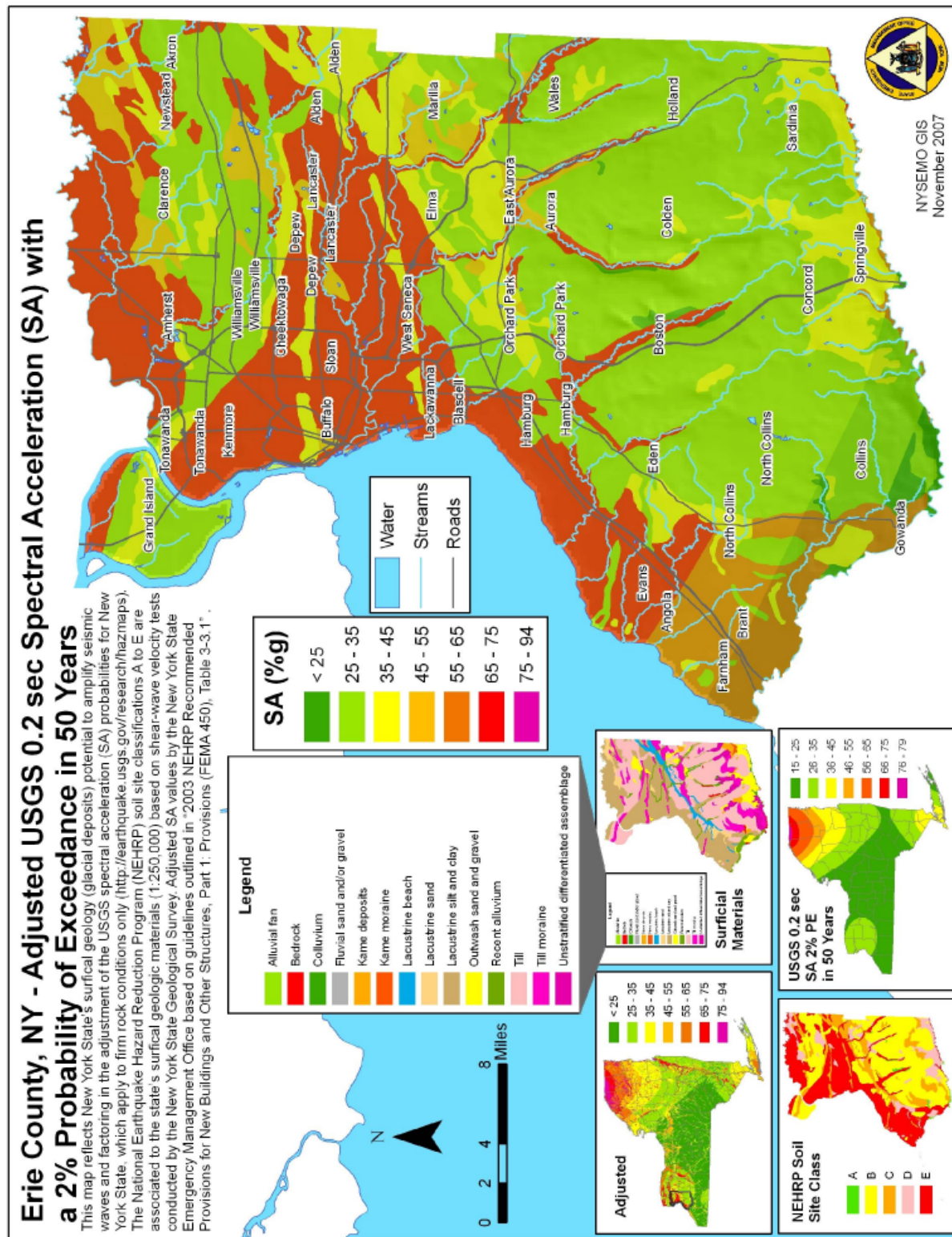
⁶ While **PGA (peak ground acceleration)** is what is experienced by a particle on the ground, **spectral acceleration** is approximately what is experienced by a building, as modeled by a particle on a massless vertical rod having the same natural period of vibration as the building (USGS).

Figure 3a.21: Erie County Geological Soil Classification



SOURCE: NYS Geological Survey, NEHRP Soil Class Data; ESRI, U.S. Counties, 2005, 2000; Erie County Municipal Boundaries, Area Hydrography, USGS.

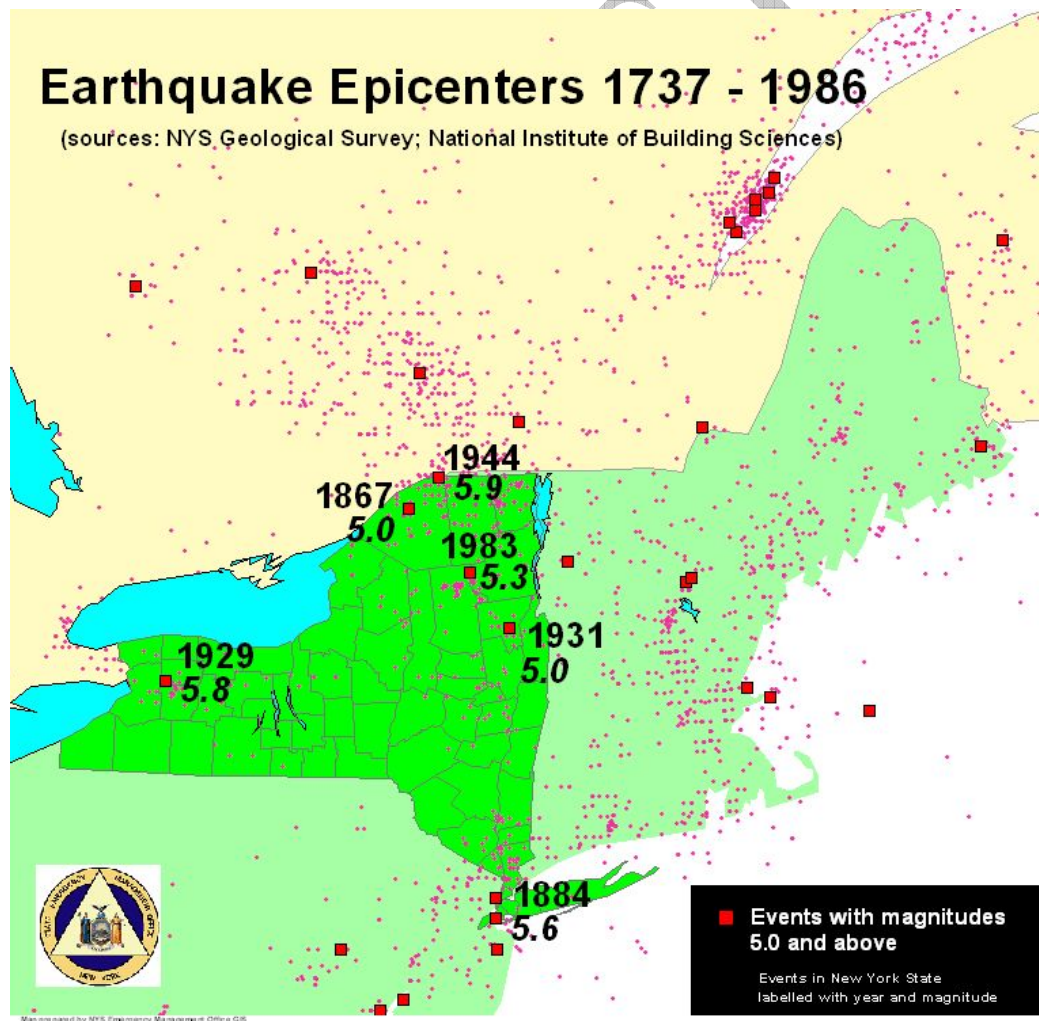
Figure 3a.22: Erie County Earthquake Hazard: Combined Seismic Risk/Soils Type



Historic Occurrences - Earthquakes

As noted in the New York State Mitigation Plan, although the probability of damaging earthquakes in New York State is low, earthquakes do occur on a regular basis in New York. **Figure 3a.23** illustrates the location of earthquake epicenters in New York, as obtained from the New York State Hazard Mitigation Plan, for earthquakes that occurred between 1737 and May 1986. **Table 3a. 18** presents details for earthquakes recorded in New York State since 1737 that were recorded in the 2006 NYS statistical yearbook. The list records one significant seismic event in the vicinity of Erie County: an event of reported magnitude 5.2 to 5.8 (depending on the source) centered on Attica in Wyoming County in August 1929. During this event, 250 chimneys fell, brick buildings were damaged, Attica prison walls incurred damage, and wells (at locations unspecified) went dry. Within Erie County, only one event is recorded in Buffalo in 1857, though this event is not deemed “significant” by nature of having a magnitude of 5.0 or above. During this event, bells rang, crocks fell from shelves. Earthquakes of magnitude less than 3.0 are considered too small to be felt or to be the cause of damage. Figure 3a.22 also shows at a handful of additional minor earthquakes have been epicentered in and around Erie County since 1737, although details of these events were not readily available.

Figure 3a.23: Significant Earthquake Epicenters in New York State (1737-1986)



SECTION 3a - RISK ASSESSMENT: HAZARD PROFILES

There has been one Federally-declared disaster in New York State due to an earthquake, following an event of Magnitude 3.1 that occurred in the far north eastern part of the state in April 2002 (with aftershocks in May 2002). Erie County was not affected by this event.

Table 3a.18
Earthquake History Throughout New York State (1737 – 2005)

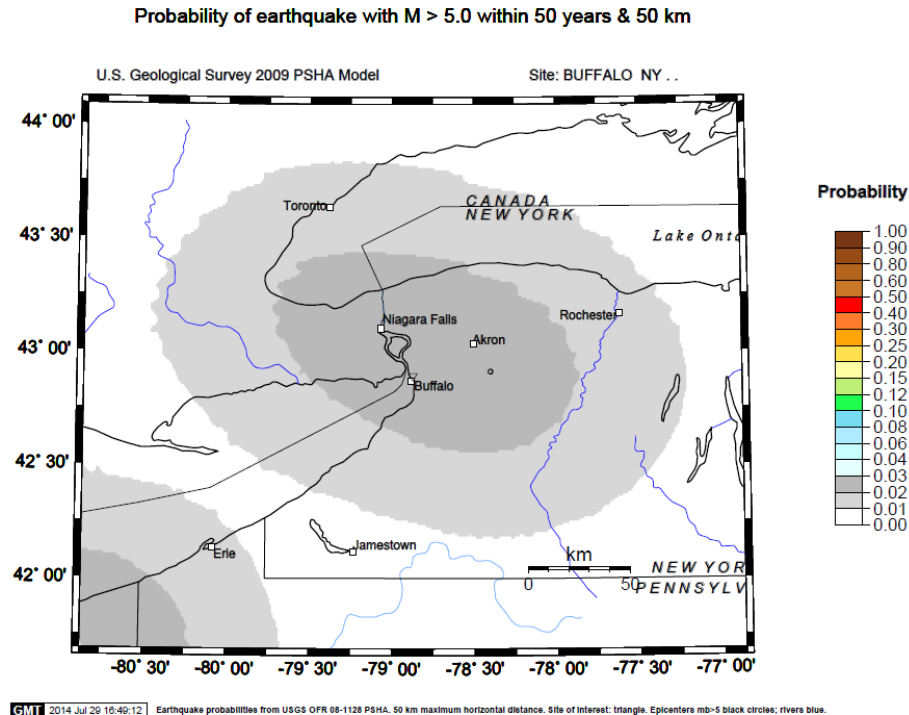
(Source: NYSEMO / NYS Statistical Yearbook 2006)

Date	Location	Size	Damage Description
December 18, 1737	New York City	5.2	Bells rang, several chimneys fell
January 16, 1840	Herkimer	3.7	No reference and/or No damage reported
September 2, 1847	Offshore NYC	3.5	No reference and/or No damage reported
September 9, 1848	Rockland Lake	V	Felt by many
March 12, 1853	Lowville	VI	Machinery knocked over
February 7, 1855	Saugerties	VI	Cryoseism
October 23, 1857	Buffalo (Lockport)	4.0	Bells rang, crocks fell from shelves
December 18, 1867	Canton, St. Lawrence County	4.7	Sleepers awakened
December 11, 1874	Tarrytown*	3.4	No reference and/or No damage reported
November 4, 1877	Lyon Mountain	VII	Chimneys down, walls cracked, window damaged, crocks overturned
August 10, 1884	New York Bight (NYC)	5.2	Chimneys and bricks fell, walls cracked
May 28, 1897	Dannemora	4.5	No reference and/or No damage reported
February 3, 1916	Schenectady	3.8	Broke windows, people thrown out of bed
March 18, 1928	Saranac Lake	4.0	No reference and/or No damage reported
August 12, 1929	Attica	5.2	250 chimneys fell, brick buildings damaged, Attica prison walls, wells went dry
April 20, 1931	Warrensburg	4.8	Chimneys fell, church spire twisted
April 15, 1934	Dannemora	3.9	House shifted
July 9, 1937	Brooklyn	3.5	No reference and/or No damage reported
September 5, 1944	Corwall, Ontario/Massena, NY	5.8	Nearly all chimneys fell, buildings damaged, \$2 million damage
September 5, 1944	Corwall, Ontario/Massena, NY	4.5	Chimneys destroyed, houses damaged
September 3, 1951	Rockland County	3.6	No reference and/or No damage reported
January 1, 1966	Attica	4.7	Chimneys and walls damaged
June 13, 1967	Attica	3.9	Chimneys and walls damaged
May 23, 1971	Blue Mountain Lake	4.1	No reference and/or No damage reported
May 23, 1971	Blue Mountain Lake	3.5	No reference and/or No damage reported
June 7, 1974	Wappingers Falls	3.0	Windows broken
June 9, 1975	Plattsburgh (Altona)	3.5	Chimneys and fireplaces cracked
November 3, 1975	Raquette Lake	4.0	No reference and/or No damage reported
February 2, 1983	Scarsdale-Lagrangeville	3.0	Chimneys cracked
October 7, 1983	Goodnow, Adirondack Mountains	5.1	Tombstones rotated, some cracked chimneys, windows broken, walls damaged
October 19, 1985	Ardsley	4.0	Windows broken, walls damaged
June 17, 1991	Richmondville	4.0	No reference and/or No damage reported
March 10, 1992	East Hampton, Suffolk County	4.1	No reference and/or No damage reported
April 20, 2000	Newcomb	3.8	No damage reported
April 20, 2002	Au Sable Forks	5.1	Cracked walls, chimneys fell, road collapsed, power outages. Federal Disaster DR-1415 was declared as a result.
May 24, 2002	Au Sable Forks	3.1	Aftershock of the April 20, 2002 event, no damage reported

Probability of Occurrence – Earthquakes

Earthquakes cannot be predicted. They strike without warning, at any time of the year, and at any time of the day or night. The probability of significant, damaging earthquake events affecting Erie County is low. According to the currently available earthquake hazard mapping of New York State, there is a 10 percent chance over 50 years that an earthquake with a minimum PGA of 3%g to 4%g will be centered within Erie County and its component jurisdictions. This earthquake, if it were to occur, would likely have associated with it light to moderate perceived shaking and little to no significant damage. More destructive earthquakes are very rare, low probability events for Erie County with highly infrequent recurrence periods. USGS mapping of earthquake probability for Erie County (**Figure 3a.24**) shows that earthquakes with magnitude $M > 5$ (have a 1 to 3 percent chance of occurring in the Buffalo area within 50 years⁷. Earthquakes in Erie County are very infrequent events; damaging events have occurred even less frequently. However, they are possible anywhere in the county, at any time and if a higher magnitude event were to occur, its impacts would likely be severe and serious.

Figure 3a.24 - Probability of earthquake with $M > 5.0$ within 50 years and 50 km (Buffalo)



Expansive Soils

Description – Expansive Soils

According to the USDOT Federal Highway Administration, the term “expansive soils” is defined as a category of soils that, due to their intrinsic and/or extrinsic nature, will exhibit some degree of volume change with variations in moisture conditions. Intrinsic properties that affect the degree of expansiveness of a soil include: the type and amount of clay minerals in the soil grain size, and

⁷ Earthquake probabilities from USGS OFR 08-1128 PSHA, 50 km maximum horizontal distance. Site of interest: triangle. Epicenters mb>5 black circles; rivers blue.

cementation. Extrinsic properties affecting expansiveness include: amount and distribution of rainfall, topography, depth, soil moisture, fluctuation of groundwater level, and the effects of man including compacted density, type of structure, and drainage features related to the structure. The most important properties affecting degree of volume change in a soil are clay mineralogy and the aqueous environment.

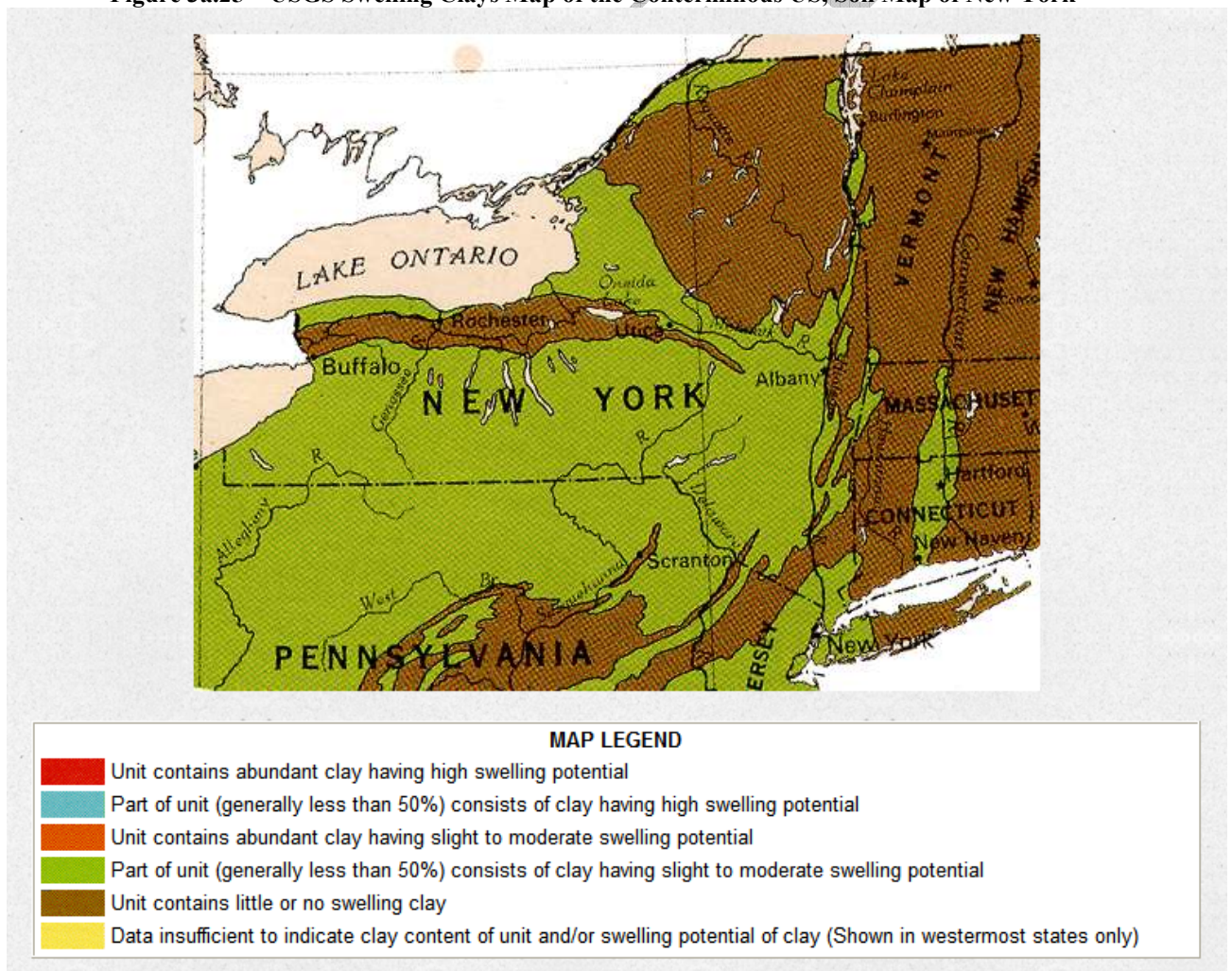
Expansive soils will exhibit expansion caused by the intake of water, and, conversely, will exhibit contraction when moisture is removed by drying. Generally speaking, they often appear sticky when wet, and are characterized by surface cracks when dry.

Expansive soils exist across the country. They become a problem when structures are built upon them without taking proper design precautions into account with regard to soil type.

Location and Extent – Expansive Soils

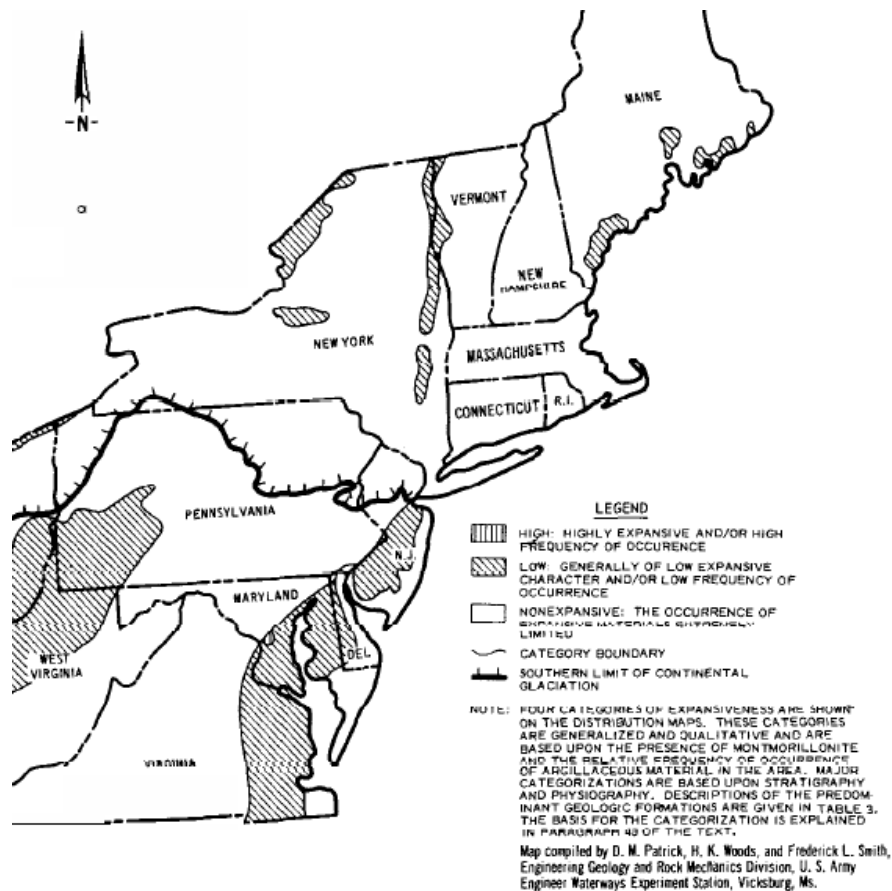
The US Geological Survey's Swelling Clays Map of the Conterminous U.S. shows that the soils in Erie County have relatively little swelling potential (**Figure 3a.25**). The bulk of the county is shown as having slight to moderate swelling potential in less than 50 percent of its soils. A narrow band in the extreme northwestern region of the County is shown as having little or no swelling clays.

Figure 3a.25 – USGS Swelling Clays Map of the Conterminous US, Soil Map of New York



Furthermore, USDOT Federal Highway Authority's Report No. FHWA-RD-76-82, "An Occurrence and Distribution Survey of Expansive Materials in the United States by Physiographic Areas" shows Erie County lying in an area mapped as non-expansive, with the occurrence of expansive materials extremely limited (**Figure 3a.26**). Non-expansive areas are defined as areas mainly underlain by materials which, by their physical makeup, do not exhibit expansive properties and which, upon weathering, do not develop expansive soils.

Figure 3a.26 – Distribution of Potentially Expansive Materials



Expansive soils are also not identified as a significant hazard of concern in the New York State Hazard Mitigation Plan.

Based on all sources reviewed, historic occurrences of damages associated with expansive soils in Erie County are only known to be located in the **Town of Amherst**. The USACE and the Town conducted a one-year cooperative investigation of residential foundation damages between 2004 and 2005. The USACE's "Town of Amherst Soils and Residential Foundation Study" evaluated 1,095 reports of slight to severe foundation damage between 1987 and 2005. The majority of houses are located north of Main Street and within lacustrine soils. Expansive soils, compressible substrata, post-construction hydrologic modification, marginally effective foundation design, poor construction, and inadequate observation/documentation were all identified as potential contributing factors at most sites. It noted that foundation failure is a relatively common problem for residential structures built on expansive soils. Fine-grained lacustrine soils in Amherst have medium to high potential expansion. Stiff, fine-grained lacustrine foundation soils are expansive and may contribute to differential movements of the overlying house as laterally variable changes in foundation soil moisture content occur.

Expansive soils in and of themselves do not have a duration or speed of onset, as there is no event per se, but rather a series of observed consequences to a structure built on soils that have been shrinking and swelling over a period of time. The onset of these consequences can't really be quantified, as they are most typically observed on a gradual basis. Similarly, their duration is not typically a specific window of time that can be quantified, but rather an ongoing condition as a result of construction practices that did not appropriately account for this soil type. In the case of certain types of foundation damage, for example, cracks typically grow in length and width over a period of time, often several months.

Expansive soils are only considered to be a hazard of significant concern in the Town of Amherst, where approximately three to four percent of residential structures have been adversely affected.

Historic Occurrences – Expansive Soils

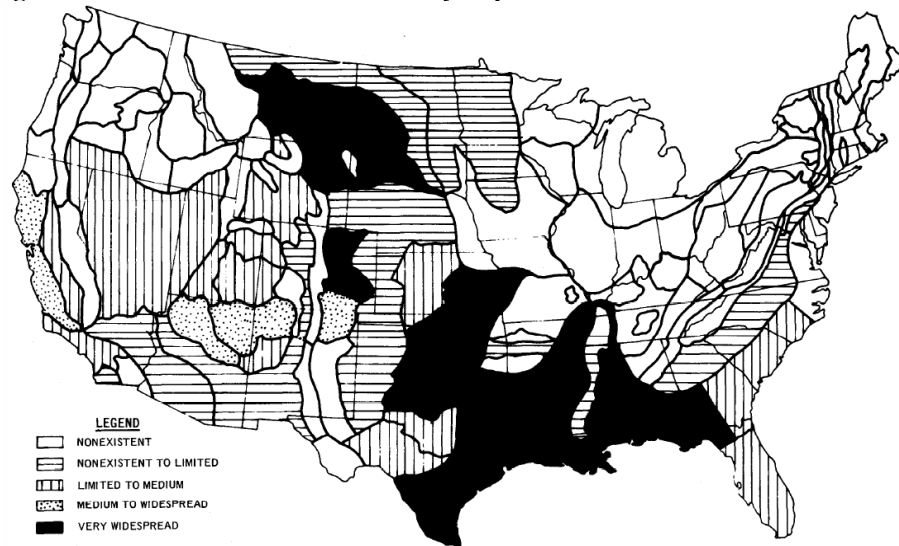
Historic occurrences of damages associated with expansive soils are only known to exist in the Town of Amherst, generally north of Main Street. While the USACE reports that the vast majority of houses in Amherst are performing as expected, an anomalous number of homeowners (1,095 between the years 1987 and 2005 – three to four percent of the total residential structures in the town) have reported slight to severe foundation-related damage and/or structural damage, in part due to building on expansive soils. New development generally has few reported problems. The current damage rate for houses is about three to four percent, but some affected neighborhoods reported damage rates that are an order of magnitude greater. The average total repair cost as indicated from repair permits is about \$7,900, but the range is about \$500 to \$71,000.

The USACE reports that risks associated with building on expansive soils have been well known for decades in such western states as Colorado, Texas and California. However, experience with expansive soils in the Northeast is relatively uncommon. Foundation design on expansive soils presents challenges because traditional design criteria are often irrelevant.

Prior to the year 2003, the building codes for one-and two-family dwellings under 40 feet in height (Building Code of the Town of Amherst, 1936-1977; NY State Building Construction Code, 1977-1983; NY State Uniform Fire Prevention and Building Code, 1984-2002) allowed the bearing capacity of the soil to be based on the presumptive bearing value for that soil, as determined by identifying the soil type and then obtaining a bearing value as listed in a table contained in various design manuals, building codes, or engineering books. This methodology does not involve any geotechnical analysis. It was not until the passage of the Residential Code of New York State in 2003 that soil tests became required to determine the soil's characteristics at a particular location within areas likely to have expansive, compressible, shifting or other unknown soil characteristics. While New York State building codes include provisions for building on expansive soils (through design, removal or stabilization) so that new construction will be protected, the USACE Amherst report noted that it does not provide in-depth guidance regarding design, construction, assessment, and repair of foundations in the soil conditions found in Amherst.

Probability of Future Occurrence – Expansive Soils

As shown in **Figure 3a.27** (from USDOT Federal Highway Authority's Report No. FHWA-RD-76-82, "An Occurrence and Distribution Survey of Expansive Materials in the United States by Physiographic Areas"), the occurrence of expansive soils in New York State (including Erie County) is generally expected to be nonexistent except in areas of known documented historic occurrences, such as in the Town of Amherst.

Figure 3a.27 – Distribution of Potentially Expansive Materials in the United States

The current readily available data regarding historic occurrences does not permit any reliable estimation of the frequency of future occurrences, beyond saying that expansive soils do exist in Amherst, residential structures built before 2003 are not likely to have been designed to properly account for this soil type, and that future damages are likely to be reported on a regular basis (which based on historic occurrences, has been 1,095 between 1987 and 2005 or approximately 60 per year).

Mitigation Strategy for Expansive Soils

Since 2003, the current New York State Building code has included provisions for building on expansive soils so that new construction will be protected. It requires soil tests at a particular location within areas likely to have expansive, compressible, shifting or other unknown soil characteristics. However, it does not provide in-depth guidance regarding design, construction, assessment, and repair of foundations in the soil conditions found in Amherst, where soils are generally expansive and may contribute to differential movement of the overlying house as laterally variable changes in foundation soil moisture content occur.

The USACE's primary recommendation to the Town of Amherst as a result of the study was to develop and adopt new guidelines for the design/construction and assessment/repair of residential foundations to supplement existing building codes. This has been completed, with the Town's passage of Chapter 83 – Building Construction Administration, Part X – Reinforcement of Residential Foundations, which provides specific: reinforcement specifications for both vertical and horizontal reinforcements, with reinforcing steel in accordance with ACI 318-99, Building Code requirements for structural concrete); requirements for basement floor slabs to be installed with woven wire mesh, fiber mesh or reinforcing steel; requirements for soil for backfill (backfill within 24 inches around the foundation walls shall not consist of cohesive or expansive soils); and a specific prohibition of unreinforced foundation walls.

The USACE's secondary recommendation was for homeowners to conduct an annual foundation inspection and retaining a licensed, qualified engineer when appropriate. This has also been completed. The Town of Amherst has a robust public outreach program and a substantial amount of information on their web site for homeowners. This existing process of protection of new construction, repairing existing construction in a manner that is most likely to provide protection against future damages, and educating homeowners is determined to be an effective, holistic

approach for the Town of Amherst and therefore, no additional mitigation measures for expansive soils are included in the Town's mitigation strategy at this time.

In future updates of this plan, if additional hazard areas are identified, those municipalities should consider mitigation measures such as the code modifications and education programs underway in the Town of Amherst.

Landslide

Location - Landslide

The USGS and NYGS have delineated areas throughout the county where large numbers of landslides have occurred and areas which are generally susceptible to land sliding. According to this mapping, the vast majority of New York State (80 percent) has a low susceptibility to landslide hazard. In general the highest potential for landslides can be found along major river and lake valleys that were formerly occupied by glacial lakes resulting in glacial lake deposits (glacial lake clays) and usually associated with steeper slopes, such as the Lake Ontario Region. USGS landslide susceptibility mapping uses three basic classifications to communicate the risk, in conjunction with three further classifications to communicate the combinations of susceptibility and incidence⁸:

- High incidence (greater than 15 percent of the area involved)
- Moderate incidence (1.5 to 15 percent of the area involved)
- Low incidence (less than 1.5 percent of the area involved)
- High susceptibility/moderate incidence
- High susceptibility/low incidence
- Moderate susceptibility/low incidence

This data shows much of the county's land area is mapped as low incidence; however, areas of moderate susceptibility/low incidence, and moderate incidence, do exist – generally, in Erie County's northwestern regions⁹. Mapped areas of susceptibility are illustrated in **Figure 3a.28** along with the locations of historic landslide occurrences as recorded by the New York State Geological Survey (NYSGS) and described further under "Historical Occurrences."

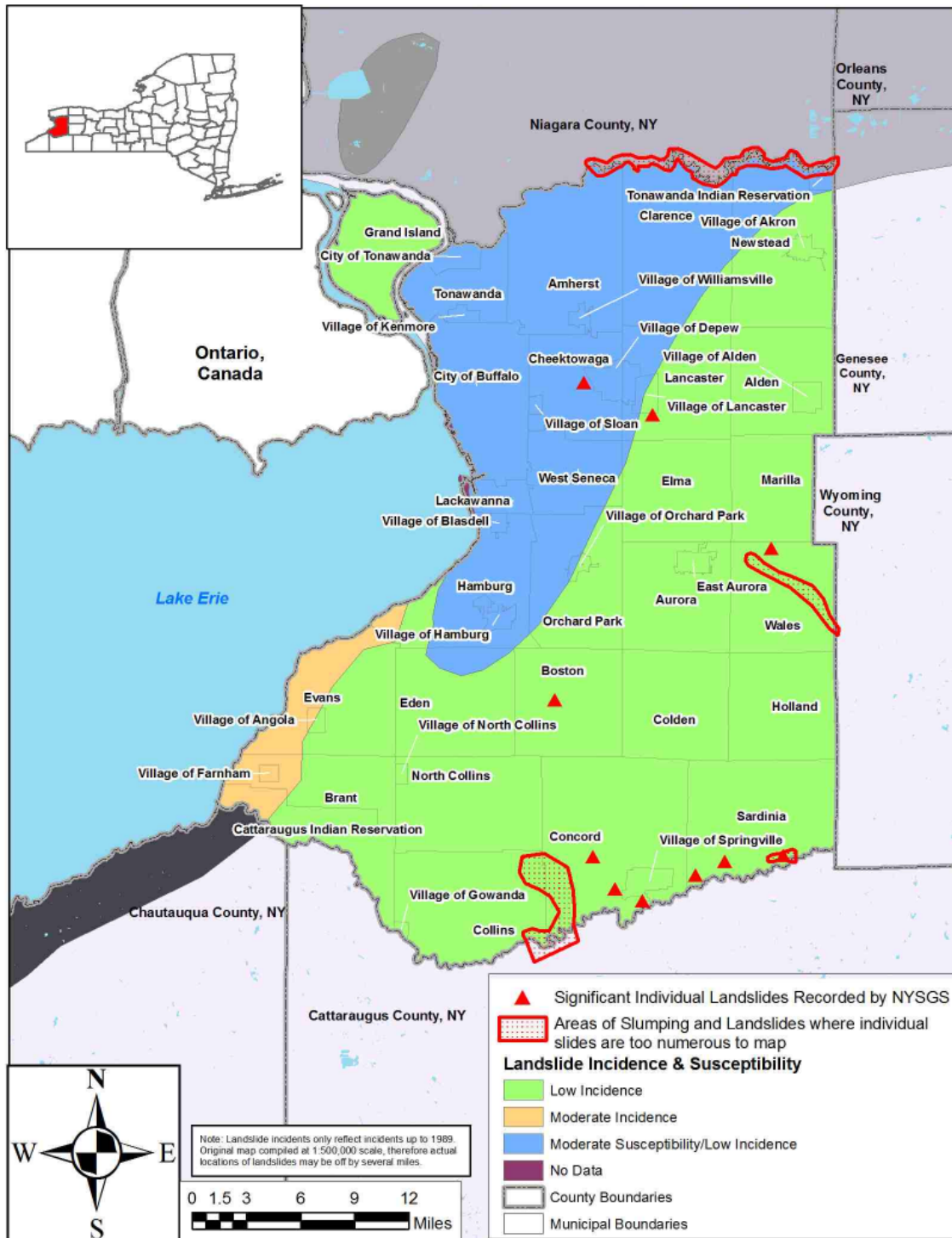
Landslides are more likely to occur in areas where they have happened in the past. The "Landslide Inventory Map of New York"¹⁰, plots the location of 11 landslide events in Erie County between 1837 and 1989. In addition, there are three areas noted as areas of slumping and landslides where individual slides are too numerous to map. Locations included: along Buffalo Creek in East Aurora; Springville / Route 39; Sardinia; Scajaquada Creek in Cheektowaga; and Cayuga Creek in Lancaster. Based on historic occurrences, affected areas have often been along creeks where rushing waters erode the toe of the bank with zero dollars in property damage (with the exception of a single event record that was reported to have caused \$250,000 in damages (1980's dollars)).

⁸ The USGS provides the following supporting narrative for the landslide hazard classifications: "Susceptibility not indicated where same or lower than incidence. Susceptibility to land sliding was defined as the probably degree of response of [the areal] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of land sliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated."

⁹ The horizontal accuracy of the USGS landslide hazard area GIS file has a certain degree of error, which places a very small portion of the hazard area within the municipal boundary of Sea Bright; however, this area has been discounted as it is over water.

¹⁰ Produced by the New York State Geological Survey (NYSGS) in cooperation with the United States Geological Survey

Figure 3a.28: Landslide Incidence and Susceptibility, Erie County



SOURCE: ESRI, U.S. Counties, 2005; New York Major Roads, 2000; Erie County Municipal Boundaries, New York State, 2001; Area Hydrography, USGS, National Seismic Hazard Maps, 2008; Robert H. Fickles NYSGS & Earl E. Brabb USGS, Landslide Inventory Map of New York, 1989.

Extent – Landslide

Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels and developed hillsides where leach-field septic systems are used. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high. Landslides occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. Although in New York landslides are not as common as in other areas of the United States, they are a geologic hazard in areas with steep to moderate slopes or geologic units prone to failure.

Historic Occurrences – Landslides

The “Landslide Inventory Map of New York” produced by the New York State Geological Survey (NYSGS) in cooperation with the United States Geological Survey, plots the location of 11 landslide events in Erie County between 1837 and 1989, as well as three areas where individual slides are too numerous to map. Data sheets obtained from the NYSGS for most of the individual mapped landslide events do not record the dollar damages caused by most of these events; however, a single event record was reported to have caused \$250,000 in damages (1980’s dollars). The details available for landslides in Erie County recorded by NYSGS are presented in **Table 3a.19**.

Record	Cause	Municipality	Location	Description *	Damage Estimate
1	Man-induced	Springville	Route 39	Till or lake clay	Not identified
2	Not identified	Springville	Route 39	Sheeting 30 feet long, houses on steps, slide	Not identified
3	Natural	East Aurora	Not identified	Slide into Buffalo Creek. 15 acre lake created. Regional DOT reports creek erosion slides all along Buffalo Creek from [illegible] to county line.	Not identified
4	Natural	Springville	Near Springville, east of intersection of Route 39 with Route 240	Slumps occur on exposures of clayey till – [illegible]	Not identified
5	Natural	Springville	Just south of Springville	Slumps occur on exposures of clayey till – [illegible]	Not identified
6	Natural	Not identified	East of Morton Corners area, on both sides of creek that crosses Route 39	Slumps occur on exposures of clayey till – [illegible]	Not identified
7	Natural	Sardinia	Just south of Sardinia	Slumps occur on exposures of clayey till	Not identified
8	Natural	Sardinia	Southwest of Sardinia	Slumps occur on exposures of clayey till	Not identified
9	Natural	Not identified	Shero Road - west of Patchin	Stream erosion	Not identified
10	Man-induced (seepage - saturation of embankment)	Cheektowaga	Scajaquada Creek Flood Control Project	Failures have occurred along the cut slopes of a local flood control project. Four separate phases of slides were repaired. The total reach of sliding was about 1/4 mile (both banks). Oversaturated soils after water level drops.	~ \$250,000

Table 3a. 19 Landslide Events Recorded by NYSGS in Erie County (1837 – 1989)					
Record	Cause	Municipality	Location	Description *	Damage Estimate
11	Natural	Lancaster	Cayuga Creek Flood Control Project	Erosion of outer bend of Cayuga Creek has resulted in sliding and threat to road above	Not identified
* Note- Hard copy event records handwritten; some handwriting was illegible, as noted in the descriptions.					

Probability of Occurrence – Landslides

While it is certainly possible for landslides to occur within Erie County, the current readily available data regarding historic occurrences does not permit any reliable estimation of the frequency of future occurrences. Eleven incidents are noted specifically by NYSGS between 1837 and 1989, which would imply an infrequent rate of about one event every 13 to 14 years. However, three areas in the county are identified as “areas of slumping and landsliding where individual slides are too numerous to map” and a number of events and record length were not available to generate an estimated frequency. Overall, the frequency of landslides in Erie County can be described (as in the County HAZNY) as relatively infrequent events.

Wildfires

Location – Wildfires

Wildfires can occur in areas essentially void of development, or in areas where development intermingles with these natural areas (known as the “urban-wildland interface”). Many wildfires occur in locations that abound in dense forests, grasslands and shrubs. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk.

For the purposes of this plan, areas considered to be at risk include deciduous, evergreen, and mixed forest, shrub land, and grassland. Agricultural land (including cropland and pastureland) and vegetated developed open space such as golf courses and sports fields are not considered to be at significant risk from wildfire for the purposes of this plan and its component risk assessment.

Wildfire hazard areas can be divided into two categories:

- areas in which the component parcels include some improved value (i.e., structures are present); and
- areas for which no improved value and hence no structures are associated with the component parcels.

This allows a general determination to be made regarding those areas at risk from wildfire in which there is a higher likelihood that such fires could also pose a threat to lives and structures, in addition to developed areas which have a direct interface with the wildfire risk areas.

Areas of greatest wildfire hazard severity were mapped according to the methodology presented in FEMA’s Mitigation Planning How-To Guide #2, whereby extreme, high, or moderate hazard severity is assigned based on the number of critical fire weather days per year, the fuel classification(s) (high, medium, or low) in the wildland-urban interface, and the slope of the land (as summarized in **Table 3a.20**). This shows that higher critical fire weather frequencies, higher slopes, and heavier fuels are associated with increased risk.

Table 3a.20									
Fire Hazard Severity *									
(Source: Urban Wildland Interface Code 2000, as reported in FEMA Mitigation Planning How-To #2)									
Fuel Classification	Critical Fire Weather Frequency								
	<1 day per year			2 to 7 days per year			>8 days per year		
	Slope <40%	Slope 41-60%	Slope >60%	Slope <40%	Slope 41-60%	Slope >60%	Slope <40%	Slope 41-60%	Slope >60%
Light Fuel	M	M	M	M	M	M	M	M	H
Medium Fuel	M	M	H	H	H	H	E	E	E
Heavy Fuel	H	H	H	H	E	E	E	E	E
M=Moderate Hazard; H=High Hazard; E=Extreme Hazard									

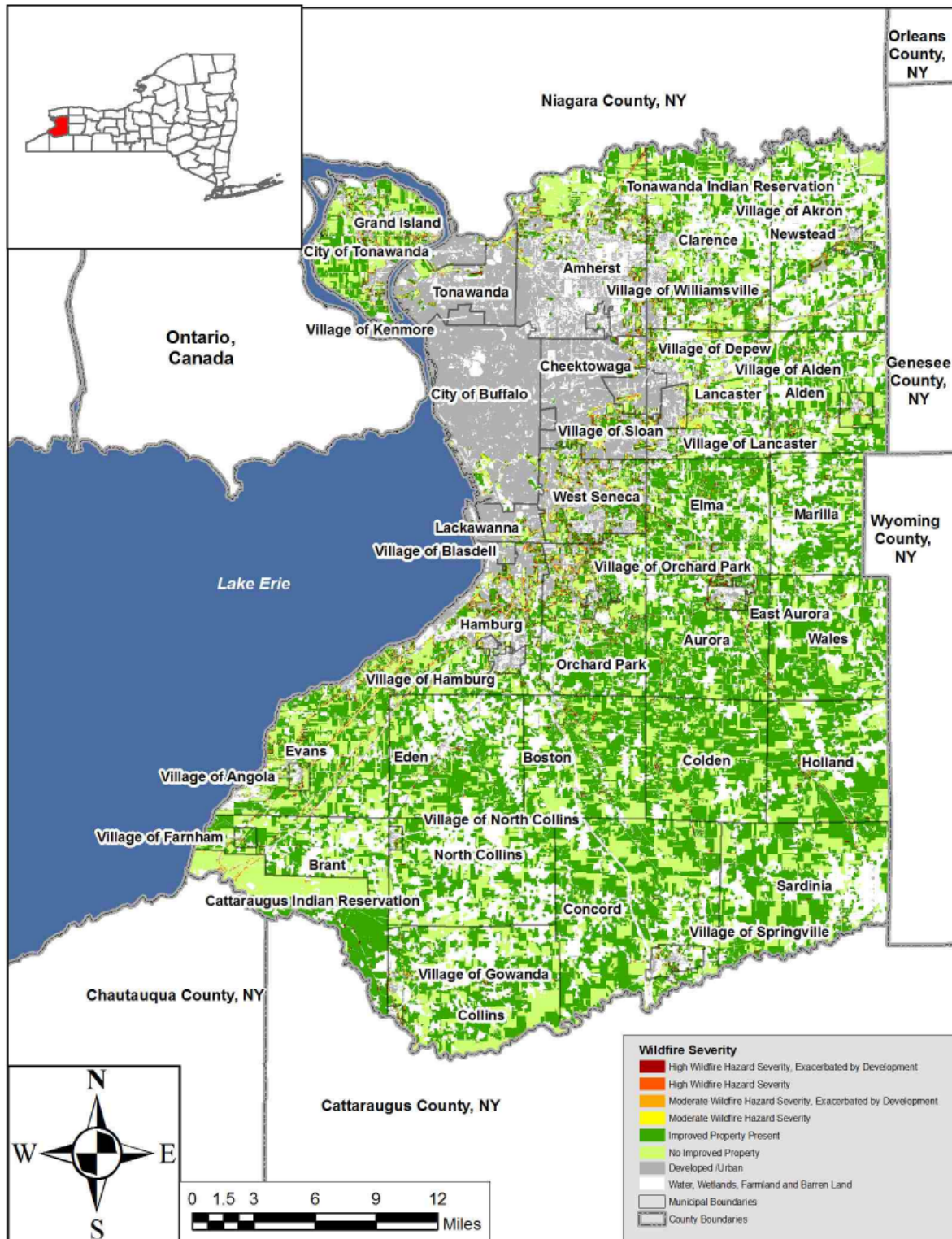
Based on historic wildfire occurrences between 1985 and 2010 as reported by NYSDEC Forest Rangers and mapped by NYSDEC, the average number of days per year of critical fire weather frequency in Erie County have been estimated as less than one. Slopes in Erie County are all mapped as 50 percent or less. Fuels range across all three classifications of light, medium, and heavy. Therefore, based on these criteria, Erie County has no extreme wildfire hazard areas. Moderate hazard areas are in areas of light to medium fuel, and high hazard areas are in areas of heavy fuel.

Figure 3a.29 shows the areas of Erie County that are considered to be at risk from wildfire as follows:

- High Wildfire Hazard Severity, Exacerbated by Development (dark red). Areas with heavy fuel in the WUI and 200 foot buffer area (regardless of slope) with improved property present.
- High Wildfire Hazard Severity (red). Areas with heavy fuel in the WUI and 200 foot buffer area (regardless of slope) with no improved property present.
- Moderate Wildfire Hazard Severity, Exacerbated by Development (dark orange). Areas with light to moderate fuel in the WUI and 200 foot buffer area (also regardless of slope in this case, since nothing in the data set is over 50 percent) with improved property present.
- Moderate Wildfire Hazard Severity (orange). Areas with light to moderate fuel in in the WUI and 200 foot buffer area (also regardless of slope in this case, since nothing in the data set is over 50 percent) with no improved property present.
- Wildfire Hazard Area – Improved Property Present (dark yellow). Areas of deciduous, evergreen, and mixed forest, shrub land, and grassland outside of the WUI and 200 foot buffer area where improved property is present.
- Wildfire Hazard Area – No Improved Property Present (yellow). Areas of deciduous, evergreen, and mixed forest, shrub land, and grassland outside of the WUI and 200 foot buffer area where no improved property is present.
- Developed/Urban (gray)
- Water, Wetlands, Farmland and Barren Land (white)

The figure shows that much of the northwestern portion of the county is not at risk of wildfires because of the substantial amount of development in the City of Buffalo and its surrounding suburban areas. Southeastern areas of the county are more undeveloped and generally at greater risk.

Figure 3a.29: Wildfire Risk Areas in Erie County



SOURCE: ESRI, U.S. Counties, 2005, Erie County Municipal Boundaries, Area Hyrdography, 2007, USGS NLCD Zone 65 Land Cover Layer, 2003.

Extent – Wildfires

The extent (that is, magnitude or severity) of wildfires depends on weather and human activity. NJFFS uses two indices to measure and monitor dryness of forest fuels and the possibility of fire ignitions becoming wildfires. The State Plan notes that these indices include the National Fire Danger Rating System's Buildup Index, and the Keetch-Byram Drought Index. Both are used for fire preparedness planning, which includes the following: campfire and burning restrictions, fire patrol assignments, staffing of fire lookout towers, and readiness status for both observation and firefighting aircraft.

- The **Buildup Index (BUI)** is a number that reflects the combined cumulative effects of daily drying and precipitation in fuels with a 10-day time lag constant. The BUI can represent three to four inches of compacted litter or can represent up to six inches or more of loose litter (North Carolina Forest Service 2009).
- The **Keetch-Byram Drought Index (KBDI)** is a drought index designed for fire potential assessment as defined by the United States Department of Agriculture Forest Service. It is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers. The index increases each day without rain and decreases when it rains. The scale ranges from zero (no moisture deficit) to 800 (maximum drought possible). The Florida Forest Service states that the range of the index is determined by assuming that 8 inches of moisture in a saturated soil is readily available to the vegetation. For different soil types, the depth of soil required to hold eight inches of moisture varies. A prolonged drought influences fire intensity, largely because more fuel is available for combustion. The drying of organic material in the soil can lead to increased difficulty in fire suppression.

There are also many other scales and fire weather indices that evaluate wildfire *potential* on any given day taking into account factors such as daily weather and vegetation condition information, fuel moisture, fuel hazard, moisture content in the lower atmosphere, etc.

According to the Erie County HAZNY, wildfires occur with no warning, and their duration is typically less than one day. Wildfires can occur at any time of the year, but will usually occur during warmer and dryer months. Wildfires are most commonly caused by people (i.e., arson, debris burns, and carelessness) and are inherently random events. Lightning is the next most common cause of wildfires. As reported by the Wildland Fire Assessment System (WFAS) the severity of wildfires resulting from a lightning strike largely depend on the duration of the current and the kind of fuel the lightning hits. Spread of the wildfire after ignition usually depends primarily on fuel moisture.

Historic Occurrences – Wildfires

While wildfires are considered by some communities to be a significant hazard in Erie County, occurring regularly in some areas, only one specific record of occurrence was found in the course of research for this plan. The SHELATUS database records one fire in 1962 to which more than \$8,000 in damages were attributed, but does not specify the location. Based on the hazard type recorded for this event, it would appear as if the fire were sparked by lightning during a severe thunder storm. The New York State Hazard Mitigation Plan does not report any specific historical instances of wildfires in Erie County.

The planning team has noted that the types of wildfires that have historically occurred in Erie County have tended to be smaller brush fires, commonly along railroad tracks. More detailed information was not available, beyond noting that damage is typically very small with these brush fires because they have noted that wildfires in Erie County have not posed the threats that western wildfires typically do, or even New York State's own Adirondack Fires of 2002, or Sunrise Fires on Long Island in 1995.

Probability of Occurrence - Wildfires

Wildfire events will remain at least an occasional occurrence in Erie County, and although there is insufficient readily available data that could be used to calculate actual probabilities, future occurrences of wildfires in the County is considered to be certain, particularly if drought conditions become more prevalent in the future with climate change. The likelihood of increased future development (particularly residential) could result in an increase in the length of the urban-wildland interface, an increase in the improved value of property within wildfire hazard zones, and a greater risk of property damage and danger to the public in future years. However, most wildfires in the County are typically contained and extinguished rather quickly and those events causing major property damage or life/safety threats are much less likely to occur. Furthermore, Erie County's communities frequently work with various railway companies to ensure that grass along the railroad tracks are mowed frequently, as a means of mitigating the most common noted occurrences of wildfires by participating jurisdictions.

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SECTION 3b - RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Overview

An inventory of geo-referenced assets in Erie County has been created in order to identify and characterize property and persons potentially at risk from the identified hazards. Understanding the type and number of hazards that exist in relation to known hazard areas is an important step in the process of formulating the risk assessment and quantifying the vulnerability of the municipalities that make up Erie County. For this plan, six key categories of assets have been mapped and analyzed using GIS data provided by Erie County, with some additional data drawn from other public sources:

1. Improved property: This category includes all developed properties according to parcel data provided by Erie County and equalization rates from the New York State Office of Real Property Services. Impacts to improved properties are presented as a percentage of each community's total value of improvements that may be exposed to the identified hazards.
2. Emergency facilities: This category covers all facilities dedicated to the management and response of emergency or disaster situations, and includes emergency operations centers (EOCs), fire stations, police stations, ambulance stations, shelters, and hospitals. Impacts to these assets are presented by tabulating the number of each type of facility present in areas that may be exposed to the identified hazards.
3. Critical infrastructure and utilities: This category covers facilities and structures vital to the maintenance of basic living conditions in the county, and includes power generating stations, potable water treatment plants, wastewater treatment plants, significant public works buildings, airports, and ferry ports. Impacts to these assets are presented by tabulating the number of each type of facility present in areas that may be exposed to the identified hazards.
4. Other key facilities: This category covers facilities which may be capable of providing refuge and limited medical care and hence may be utilized as emergency shelters, and those which routinely house more vulnerable sectors of the county population, making them potentially especially vulnerable to identified hazards. Included in this category are schools and senior care facilities and impacts to these assets are presented by tabulating the number of each type of facility present in areas that may be exposed to the identified hazards.
5. Historic and cultural resources: This category includes those historic structures, landmarks and sites that are included in the New York State or National Register of Historic Places. Impacts to these assets are presented by tabulating the number of each type of facility present in areas exposed to each identified hazard. Any other structure, landmark or asset identified during the course of general research for this section that has been judged to be potentially of local historical or cultural significance has also been included in this category.
6. Population: This category covers the number of people residing in Erie County as measured by the 2010 U.S. Census. Municipal populations are broken down by age categories to identify communities in which more vulnerable sectors of the population are concentrated.

Improved Property

Improved property covers all development in the form of structures for residential, commercial, industrial, municipal, recreational, and utility uses. The total value of property improvements in the 44 Erie County jurisdictions has been estimated at approximately \$48 billion, based on total assessed values converted to

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

market values using State equalization rates supplied for each jurisdiction by the New York State Office of Real Property Services (where the assessed value of improvements was calculated by subtracting the assessed value of the land from the total assessed value of the parcel). While this methodology does not provide an estimation of the actual replacement cost of buildings in the County’s municipalities, the consistent application of this calculation for all municipalities provides a figure to be used for comparison of exposure across the different municipalities and for different hazards within each municipality. The estimated value of improved property in hazard areas in any municipality is intended as a tool to aid in conceptualizing and prioritizing risk for mitigation planning purposes. It is in no way binding, it is not presented on a property-by-property basis, and it will not be used by FEMA to calculate or influence payments for future disaster losses under such programs as the National Flood Insurance Program (NFIP), Public Assistance or Individual Assistance Programs.

Table 3b.1 summarizes the improved properties in each jurisdiction, in terms of total parcels, percentage of improved parcels, and the total value of improvements in each, based on GIS data provided by Erie County.

“Delineated” hazards are those which only affect specific identifiable areas as opposed to those assumed to have a uniform risk across the entire planning area; i.e., extreme wind events, winter storms, extreme temperatures.

Detailed tables presenting the improved property values broken down by land use and development type within delineated hazard areas are included in **Appendix A**.

**SECTION 3B – RISK ASSESSMENT:
IDENTIFICATION AND CHARACTERIZATION OF ASSETS**

Table 3b.1 Improved Property by Jurisdiction	
Municipality	Total Value of Improvements*
Akron, Village of	\$147,386,383
Alden, Town of	\$596,764,911
Alden, Village of	\$113,968,804
Amherst, Town of	\$8,287,199,614
Angola, Village of	\$70,253,637
Aurora, Town of	\$732,629,812
Blasdell, Village of	\$105,746,861
Boston, Town of	\$395,564,101
Brant, Town of	\$80,726,326
Buffalo, City of	\$7,836,060,944
Cheektowaga, Town of	\$3,843,969,994
Clarence, Town of	\$2,451,434,606
Colden, Town of	\$210,932,688
Collins, Town of	\$140,401,209
Concord, Town of	\$266,337,175
Depew, Village of	\$687,275,077
East Aurora, Village of	\$502,982,763
Eden, Town of	\$508,945,663
Elma, Town of	\$963,279,568
Evans, Town of	\$688,158,533
Farnham, Village of	\$9,217,429
Gowanda, Village of	\$181,711,307
Grand Island, Town of	\$1,374,192,506
Hamburg, Town of	\$2,856,457,549
Hamburg, Village of	\$529,422,415
Holland, Town of	\$198,103,906
Kenmore, Village of	\$550,842,370
Lackawanna, City of	\$491,989,230
Lancaster, Town of	\$1,660,594,610
Lancaster, Village of	\$450,761,881
Marilla, Town of	\$311,762,654
Newstead, Town of	\$275,242,465
North Collins, Town of	\$98,650,414
North Collins, Village of	\$37,194,174
Orchard Park, Town of	\$2,336,738,931
Orchard Park, Village of	\$236,478,010
Sardinia, Town of	\$171,167,007
Sloan, Village of	\$88,611,517
Springville, Village of	\$251,444,560
Tonawanda, City of	\$554,227,967
Tonawanda, Town of	\$3,937,290,613
Wales, Town of	\$184,189,527
West Seneca, Town of	\$2,487,649,101
Williamsville, Village of	\$313,415,097
Erie, County of	\$48,217,373,909

*Not including some public buildings and other tax-exempt structures

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Emergency Facilities

Emergency facilities were included in the asset identification and characterization to determine jurisdictions with particularly high numbers of key facilities located in hazard areas, which may guide the focus of individual mitigation activities in the mitigation goals and strategy stage of the plan. Emergency facilities by jurisdiction are presented in **Table 3b.2**. According to County GIS data and other county records, and databases embedded in HAZUS-MH (a risk-assessment tool made available by FEMA), there are a total of 628 geo-referenced emergency facilities in the 44 municipalities that comprise Erie County.

The exposure of identified emergency services to hazards with discrete delineable impact areas is presented in **Appendix B**.

Municipality	Fire Stations	Police Stations	EOCs	Medical Facilities	Hospitals	Rescue Squads	Shelters
Akron, Village of	1	1	0	0	0	0	2
Alden, Town of	3	1	0	0	0	0	2
Alden, Village of	2	1	0	1	0	0	2
Amherst, Town of	17	1	1	11	1	0	19
Angola, Village of	0	0	0	0	0	0	0
Aurora, Town of	4	2	0	2	1	0	2
Blasdell, Village of	0	0	0	0	0	0	0
Boston, Town of	5	1	0	1	0	1	2
Brant, Town of	2	1	0	0	0	0	2
Buffalo, City of	25	21	4	28	9	1	84
Cheektowaga, Town of	21	3	0	2	1	0	22
Clarence, Town of	5	3	0	3	0	0	5
Colden, Town of	3	1	0	0	0	0	1
Collins, Town of	5	2	0	0	0	1	0
Concord, Town of	5	1	0	2	1	0	9
Depew, Village of	0	0	0	0	0	0	0
East Aurora, Village of	0	0	0	0	0	0	0
Eden, Town of	2	1	0	0	0	1	1
Elma, Town of	5	0	0	0	0	0	4
Evans, Town of	9	2	0	2	0	0	7
Farnham, Village of	0	0	0	0	0	0	0
Gowanda, Village of	0	0	0	0	0	0	0
Grand Island, Town of	4	1	0	2	0	0	4
Hamburg, Town of	12	2	0	1	0	1	16
Hamburg, Village of	3	2	0	1	0	0	9
Holland, Town of	2	0	0	0	0	0	4
Kenmore, Village of	0	0	0	0	0	0	0
Lackawanna, City of	4	3	1	1	1	0	5
Lancaster, Town of	8	1	0	1	0	0	2
Lancaster, Village of	6	3	0	1	0	1	7
Marilla, Town of	1	0	0	0	0	0	0
Newstead, Town of	2	1	0	1	0	0	3
North Collins, Town of	3	0	0	0	0	0	1
North Collins, Village of	1	2	0	1	0	1	1
Orchard Park, Town of	5	2	0	5	0	0	5
Orchard Park, Village of	2	1	0	0	0	0	3
Sardinia, Town of	4	1	0	0	0	0	0
Sloan, Village of	0	0	0	0	0	0	0
Springville, Village of	0	0	0	0	0	0	0

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Table 3b.2 Emergency Facilities by Jurisdiction							
Municipality	Fire Stations	Police Stations	EOCs	Medical Facilities	Hospitals	Rescue Squads	Shelters
Tonawanda, City of	5	2	0	0	0	1	7
Tonawanda, Town of	11	5	0	5	1	1	7
Wales, Town of	3	0	0	0	0	0	2
West Seneca, Town of	9	2	0	5	0	0	13
Williamsville, Village of	0	0	0	0	0	0	0
Erie County Total:	199	70	6	76	15	9	253

Critical Infrastructure and Utilities

Critical infrastructure and utilities were included in the asset identification and characterization to determine jurisdictions with particularly high numbers of key facilities located in hazard areas, which may guide the focus of individual mitigation activities in the mitigation goals and strategy stage of the plan. Critical infrastructure and utilities by jurisdiction are presented in **Table 3b.3**. According to County GIS records and databases embedded in HAZUS-MH, there are a total of 364 identified georeferenced critical infrastructure and utility facilities in the planning area.

Airports has been taken to mean substantial airfields with paved runways operating scheduled services or suitable for the operation of fixed-wing aircraft for the transporting of emergency response personnel and equipment.

Communications facilities are transmitting stations for emergency services or for radio and/or television stations licensed by the Federal Communications Commission.

The exposure of identified critical facilities and infrastructure assets to hazards with discrete delineable impact areas is presented in **Appendix B**.

Table 3b.3 Critical Infrastructure and Utilities by Jurisdiction								
Municipality	Wastewater Facilities	Rail Stations	Airports	Oil Facilities	Electric Power Facilities	Communications Facilities	Natural Gas Facilities	Chemical Facilities
Akron, Village of	0	0	0	0	0	0	0	3
Alden, Town of	2	0	0	0	0	0	0	2
Alden, Village of	0	0	0	0	0	0	0	2
Amherst, Town of	2	0	0	0	0	4	0	8
Angola, Village of	0	0	0	0	0	0	0	0
Aurora, Town of	1	0	0	0	0	1	0	2
Blasdell, Village of	0	0	0	0	0	0	0	0
Boston, Town of	0	0	0	0	0	3	0	0
Brant, Town of	0	0	0	0	0	0	0	0
Buffalo, City of	1	16	0	0	0	12	0	74
Cheektowaga, Town of	2	0	1	0	0	2	0	32
Clarence, Town of	2	0	0	0	0	1	0	3
Colden, Town of	0	0	0	0	0	3	0	
Collins, Town of	1	0	0	0	0	1	0	0

**SECTION 3B – RISK ASSESSMENT:
IDENTIFICATION AND CHARACTERIZATION OF ASSETS**

Table 3b.3 Critical Infrastructure and Utilities by Jurisdiction								
Municipality	Wastewater Facilities	Rail Stations	Airports	Oil Facilities	Electric Power Facilities	Communications Facilities	Natural Gas Facilities	Chemical Facilities
Concord, Town of	3	0	0	0	0	3	1	6
Depew, Village of	0	0	0	0	0	0	0	0
East Aurora, Village of	0	0	0	0	0	0	0	0
Eden, Town of	0	0	0	0	0	1	0	0
Elma, Town of	4	0	0	0	0	0	0	6
Evans, Town of	1	0	0	0	0	1	0	5
Farnham, Village of	0	0	0	0	0	0	0	0
Gowanda, Village of	0	0	0	0	0	0	0	1
Grand Island, Town of	1	0	0	0	0	6	0	14
Hamburg, Town of	2	0	0	0	0	5	0	16
Hamburg, Village of	1	0	0	0	0	0	0	2
Holland, Town of	1	0	0	0	0	0	0	2
Kenmore, Village of	0	0	0	0	0	0	0	0
Lackawanna, City of	1	0	0	0	0	2	0	3
Lancaster, Town of	0	0	0	0	1	2	0	6
Lancaster, Village of	2	0	0	0	0	2	0	1
Marilla, Town of	0	0	0	0	0	0	0	0
Newstead, Town of	0	0	1	0	0	0	0	5
North Collins, Town of	0	0	0	0	0	0	0	2
North Collins, Village of	0	0	0	0	0	0	0	0
Orchard Park, Town of	0	0	0	0	0	2	0	5
Orchard Park, Village of	0	0	0	0	0	1	0	0
Sardinia, Town of	0	0	0	0	0	1	0	2
Sloan, Village of	0	0	0	0	0	0	0	0
Springville, Village of	0	0	0	0	0	0	0	0
Tonawanda, City of	0	0	0	2	0	1	0	27
Tonawanda, Town of	2	0	0	2	2	3	0	7
Wales, Town of	0	0	0	0	0	1	0	0
West Seneca, Town of	2	0	1	1	0	4	0	5
Williamsville, Village of	0	0	0	0	0	0	0	0
Erie County Total:	31	16	3	7	3	62	1	241

Other Key Facilities

Other key facilities were included in the asset identification and characterization to determine jurisdictions with particularly high numbers of such facilities located in hazard areas, which may guide the focus of individual mitigation activities in the mitigation goals and strategy stage of the plan. Schools, universities, day care facilities, stadiums, and other care facilities by jurisdiction are presented in **Table 3b.4**.

The exposure of identified other key facilities is presented in **Appendix B**.

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

**Table 3b.4
Other Key Facilities by Jurisdiction**

Municipality	Schools	Universities	Day Care Facilities*	Stadiums	Care Facilities**
Akron, Village of	3	0	2	0	0
Alden, Town of	3	0	2	0	15
Alden, Village of	3	0	0	0	0
Amherst, Town of	35	5	29	2	3
Angola, Village of	0	0	0	0	0
Aurora, Town of	8	0	4	0	1
Blasdell, Village of	0	0	0	0	0
Boston, Town of	1	0	4	0	0
Brant, Town of	1	0	0	0	1
Buffalo, City of	110	8	201	2	34
Cheektowaga, Town of	26	1	30	0	7
Clarence, Town of	8	0	14	0	2
Colden, Town of	1	0	0	0	0
Collins, Town of	4	0	2	0	1
Concord, Town of	4	0	3	0	3
Depew, Village of	0	0	0	0	0
East Aurora, Village of	0	0	0	0	0
Eden, Town of	3	0	1	0	2
Elma, Town of	6	0	1	0	0
Evans, Town of	7	0	3	0	1
Farnham, Village of	0	0	0	0	0
Gowanda, Village of	0	0	0	0	0
Grand Island, Town of	6	0	4	0	1
Hamburg, Town of	10	2	0	0	2
Hamburg, Village of	11	0	6	0	2
Holland, Town of	3	0	13	0	1
Kenmore, Village of	0	0	0	0	0
Lackawanna, City of	7	1	5	0	6
Lancaster, Town of	5	0	6	0	3
Lancaster, Village of	10	0	6	0	2
Marilla, Town of	1	0	1	0	0
Newstead, Town of	3	0	5	0	0
North Collins, Town of	1	0	0	0	0
North Collins, Village of	1	0	0	0	0
Orchard Park, Town of	6	0	7	1	3
Orchard Park, Village of	3	0	2	0	0
Sardinia, Town of	0	0	1	0	0
Sloan, Village of	0	0	0	0	0
Springville, Village of	0	0	0	0	0
Tonawanda, City of	14	0	6	0	0
Tonawanda, Town of	23	0	17	0	7
Wales, Town of	1	0	1	0	0
West Seneca, Town of	20	1	12	0	4
Williamsville, Village of	0	0	0	0	0
Erie County Total:	348	18	388	5	101

* Inclusive of day care facilities and group family day care facilities

** Inclusive of adult homes, adult day care facilities, group homes, youth homes, nursing homes

Historical and Cultural Resources

Historical and cultural resources were included in the asset identification and characterization to determine jurisdictions with particularly high numbers of culturally or historically valuable assets located in hazard areas, which may influence the focus of individual mitigation activities in the mitigation goals

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

and strategy stage of the plan. At the State and Federal levels, official listings of historic resources are established and maintained to foster the preservation of particular cultural resources. The State and National Registers of Historic Places are the official listings of buildings, structures, districts, objects, and sites significant in the history, architecture, archaeology, engineering, and culture of the State and the nation. Cultural and historic resources are defined as follows:

Cultural Resources: As defined by the National Park Service in its "Cultural Resources Management Guidelines," cultural resources are: *“Those tangible and intangible aspects of cultural systems, both living and dead, that are valued by or representative of a given culture or that contain information about a culture . . . and [they] include but are not limited to sites, structures, districts, objects and artifacts, and historic documents associated with or representative of peoples, cultures, and human activities and events, either in the present or in the past. Cultural resources also can include the primary written and verbal data for interpreting and understanding those tangible resources.”*

Historic Resources: Historic resources are any cultural resource dating from the period between the onset of written records (which in northern New York State is typically placed around the time of first European contact in the sixteenth century) and 50 years ago.

In the State of New York, the State Historic Preservation Office (SHPO) – within the New York State Office of Parks, Recreation and Historic Preservation (NYS OPRHP) – helps communities identify, evaluate, preserve, and revitalize their historic and cultural resources. SHPO maintains GIS databases of all historic and cultural assets listed on the State and National Registers. To identify the resources of this nature located in Erie County, GIS files were obtained through a request to the OPRHP. This data includes only those cultural and historic properties and sites that are included in the New York State or National Registers of Historic Places, or that have been determined Eligible for inclusion through federal or state processes as administered by the SHPO. Inclusion in this data set does not preclude the existence of other historic properties or sites not within this category or as yet unidentified.

Historical and cultural assets located in Erie County are presented in **Table 3b.5**. According to New York SHPO and National Register of Historic Places data there are 157 such assets georeferenced and registered in the planning area. According to the available records, State and Federally listed historical assets are located in roughly half of the municipalities covered by this hazard mitigation plan.

The exposure of identified historical and cultural resources to hazards with discrete delineable impact areas is presented in **Appendix C**.

Table 3b.5 Historic and Cultural Resources in Erie County		
Municipality	Historic Structure / Landmark Name	Location / Address
Akron	Rich-Twinn Octagon House	145 Main Street
Akron	US Post Office--Akron	118 Main Street
Amherst vicinity	Entranceway at Main Street at Darwin Drive	Darwin Drive at Main Street
Amherst vicinity	Entranceway at Main Street at High Park Boulevard	High Park Boulevard at Main Street
Amherst vicinity	Entranceway at Main Street at Lafayette Boulevard	Lafayette Boulevard at Main Street
Amherst vicinity	Entranceway at Main Street at LeBrun Road	LeBrun Road
Amherst vicinity	Entranceway at Roycroft Boulevard and Main Street	Roycroft Boulevard and Main Street
Amherst vicinity	Entranceways at Main Street at Westfield Road and Ivyhurst Road	Westfield Road and Ivyhurst Road at Main Street
Amherst vicinity	Entranceways at Main Street at Westfield Road and Ivyhurst Road	Westfield Road and Ivyhurst Road at Main Street
Amherst vicinity	Entranceways, Lamarck and Smallwood Drives at Main Street	Lamarck and Smallwood Drives at Main Street

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**Table 3b.5
Historic and Cultural Resources in Erie County**

Municipality	Historic Structure / Landmark Name	Location / Address
Angola	US Post Office--Angola	80 N. Main Street
Buffalo	Engine House #2 and Hook & Ladder #9	310 Jersey Street
Buffalo	20th Century Club	595 Delaware Avenue
Buffalo	218 Dearborn Street	218 Dearborn
Buffalo	33--61 Emerson Place Row	33--61 Emerson Place
Buffalo	Albright-Knox Art Gallery	1285 Elmwood Avenue
Buffalo	Allentown Historic District	Off NY 384
Buffalo	Alling & Cory Buffalo Warehouse	136 North Division Street
Buffalo	Annunciation School	257 Lafayette Avenue
Buffalo	Berkeley Apartments	24 Johnson Park
Buffalo	Birge-Horton House	477 Delaware Avenue
Buffalo	Blessed Trinity Roman Catholic Church Buildings	317 LeRoy Avenue
Buffalo	Buffalo and Erie County Historical Society	25 Nottingham Court
Buffalo	Buffalo City Hall	65 Niagara Square
Buffalo	Buffalo Electric Vehicle Company Building	1219-1247 Main Street
Buffalo	Buffalo Gas Light Company Works	249 W. Genesee Street
Buffalo	Buffalo Main Light	Buffalo River
Buffalo	Buffalo Seminary (school for girls)	205 Bidwell Parkway
Buffalo	Buffalo Smelting Works	23 Austin Street
Buffalo	Buffalo State Asylum for the Insane	400 Forest Avenue
Buffalo	Buffalo State Hospital	400 Forest Avenue
Buffalo	Buffalo Tennis & Squash Club	314 Elmwood Avenue
Buffalo	Buffalo Trunk Manufacturing Company	125 Cherry Street
Buffalo	Cazenovia Park-South Park System	South Park, NW along McKinley Pkwy. to Cazenovia Park, NW along McKinley Parkway to Heacock Park
Buffalo	Concordia Cemetery	438 Walden Avenue
Buffalo	Concrete-Central Elevator	Buffalo River
Buffalo	Connecticut Street (74th Regiment) Armory	184 Connecticut Street
Buffalo	Corpus Christi Roman Catholic Church Complex	199 Clark Street
Buffalo	County and City Hall	95 Franklin Street
Buffalo	Dayton House	243 Dearborn Street
Buffalo	Delaware Avenue Historic District	W side of Delaware Avenue between North and Bryant Streets
Buffalo	Delaware Avenue Methodist Episcopal Church	339 Delaware Avenue
Buffalo	Delaware Park-Front Park System	Front Park, Porter Avenue to Symphony Circle, N along Richmond Avenue, Bidwell Parkway, Gates Circle and Delaware Park
Buffalo	Diebolt, Edward A., House	62 Niagara Falls Boulevard
Buffalo	Dorsheimer, William, House	434 Delaware Avenue
Buffalo	Durham Memorial A.M.E. Zion Church	174 E. Eagle Street
Buffalo	E & B Holmes Machinery Company Building	59 Chicago Street
Buffalo	Eberz House	285 Dearborn
Buffalo	EDWARD M. COTTER (Fireboat)	Jct. Michigan Avenue and Ohio Street
Buffalo	Engine House No. 28	1170 Lovejoy Street
Buffalo	Forest Lawn Cemetery	1411 Delaware Avenue
Buffalo	Fosdick-Masten Park High School	Masten Avenue and E. North Street
Buffalo	Garret Club	91 Cleveland Avenue
Buffalo	General Electric Tower	535 Washington Street
Buffalo	Harlow C. Curtiss Building	204-210 Franklin Street
Buffalo	Hellenic Orthodox Church of the Annunciation	1000 Delaware Avenue
Buffalo	Hotel Lafayette	391 Washington Street
Buffalo	How, James, and Fanny, House	41 St. Catherine's Court
Buffalo	Howell, Edgar W., House	52 Lexington Avenue
Buffalo	J.N.Adams--A M & A's Historic District	378-380 Washington Street

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Table 3b.5 Historic and Cultural Resources in Erie County		
Municipality	Historic Structure / Landmark Name	Location / Address
Buffalo	Johnston, Edwin M., and Emily S., House	24 Tudor Place
Buffalo	Kelly, Colonel William, House	36 Tudor Place
Buffalo	Kensington Gardens	1 - 3 Cleveland Drive
Buffalo	King, Martin Luther, Jr., Park	Roughly bounded by Northampton Street, E. Parade Avenue, Best Street and Kensington Expressway
Buffalo	Kleinhans Music Hall	Symphony Circle
Buffalo	Lafayette Ave. Presbyterian Church	875 Elmwood Avenue
Buffalo	Lafayette High School	370 Lafayette Avenue
Buffalo	Laurel and Michigan Avenues Row	1335--1345 Michigan Avenue
Buffalo	Macedonia Baptist Church	511 Michigan Avenue
Buffalo	Market Square Historic District	Amherst, Dearborn Street, etc.
Buffalo	Martin, D. D., House Complex	123 Jewett Parkway
Buffalo	Martin, Darwin D., House	125 Jewett Parkway
Buffalo	Miller, C. W., Livery Stable	75 West Huron Street
Buffalo	Nash, Rev. J. Edward, Sr., House	36 Nash Street
Buffalo	New York Central Terminal	495 Paderewski Drive
Buffalo	Packard Motor Car Showroom and Storage Facility	1325 Main Street
Buffalo	Parke Apartments	33 Gates Circle
Buffalo	Parkside East Historic District	Roughly bounded by Parkside Avenue, Amherst Street, Colvin Avenue, NY Central RR tracks, Main Street, and Humboldt Avenue
Buffalo	Parkside West Historic District	Roughly bounded by Amherst Street, Nottingham Terrace, Middlesex Road, and Delaware Avenue
Buffalo	Pierce Arrow Factory Complex	Elmwood and Great Arrow Avenues
Buffalo	Prudential Building	Church and Pearl Streets
Buffalo	Public School 13	266-268 Oak Street
Buffalo	Richmond Avenue Methodist-Episcopal Church	525 West Ferry Street
Buffalo	Riverside Park	Roughly bounded by Vulcan, Tonawanda, Crowley, and Niagara Street
Buffalo	Robert T. Coles House & Studio	521 Humboldt Parkway
Buffalo	Roosevelt, Theodore, Inaugural National Historic Site	641 Delaware Avenue
Buffalo	Saturn Club Building	977 Delaware Avenue
Buffalo	Shea's Buffalo Theater	646 Main Street
Buffalo	St. Andrews Episcopal Church	3105 Main Street
Buffalo	St. Andrew's Evangelical Lutheran Church Complex	Sherman and Peckham Streets
Buffalo	St. Francis Xavier Roman Catholic Parish Complex	157 East Street
Buffalo	St. Mary of Sorrows Roman Catholic Church	938 Genesee Street
Buffalo	St. Paul's Cathedral	139 Pearl Street
Buffalo	St. Paul's Episcopal Cathedral	125 Pearl Street
Buffalo	Stone Farmhouse	60 Hedley Place
Buffalo	The Calumet	46-58 West Chippewa Street
Buffalo	The Kamman Building	755 Seneca Street
Buffalo	The Robertson-Cataract Electric Building	100 South Elmwood Avenue
Buffalo	Trico Plant No. 1	817 Washington Street
Buffalo	Trinity Episcopal Church	371 Delaware Avenue
Buffalo	U.S. Post Office	121 Ellicott Street
Buffalo	University Park Historic District	Multiple
Buffalo	USS CROAKER (Submarine)	1 Naval Park Cove
Buffalo	USS THE SULLIVANS (destroyer)	1 Naval Cove Pk.
Buffalo	West Village Historic District	Roughly bounded by S. Elmwood Avenue, Chippewa, Georgia, Prospect, Carolina and Tracy Streets

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Table 3b.5 Historic and Cultural Resources in Erie County		
Municipality	Historic Structure / Landmark Name	Location / Address
Buffalo	Wile, M., and Company Factory Building	77 Goodell Street
Buffalo	Wollenberg Grain and Seed Elevator	131 Goodyear Avenue
Buffalo	Woodlawn Avenue Row	75--81 Woodlawn Avenue
Buffalo	Young Men's Christian Association Central Building	45 W. Mohawk Street
Buffalo	Zink Block	346 Connecticut Street
Cheektowaga	Chapel of Our Lady Help of Christians	4125 Union Road
Cheektowaga	Garrison Cemetery (War of 1812)	Aero Drive
Cheektowaga	Villa Maria Motherhouse Complex	600 Doat Street
Clarence Center	Eshelman, J., and Company Store	6000 Goodrich Road
Depew	US Post Office--Depew	Warsaw Street
Derby vicinity	Graycliff	6472 Lake Shore Road
East Aurora	Fillmore, Millard, House	24 Shearer Avenue
East Aurora	Roycroft Campus	Main and W. Grove Streets
East Aurora	Scheidmantel, George and Gladys, House	363 Oakwood Avenue
Eden Valley and vicinity	Eden Mills Historic District	
Grand Island	Spaulding-Sidway Boathouse	2296 West Oakfield Road
Irving	Thomas Indian School	NY 438 on Cattaraugus Reservation
Jerusalem Corners	First Church of Evans Complex	7431 Erie Road
Kenmore	Eberhardt Mansion	2746 Delaware Avenue
Lackawanna	Buffalo Harbor South Entrance Light	Stony Point end of Buffalo Harbor South Breakwater
Lancaster	Bruce-Briggs Brick Block	5481, 5483, 5485 Broadway
Lancaster	Clark-Lester House	5454 Broadway
Lancaster	Depew Lodge No. 823, Free and Accepted Masons	5497 Broadway
Lancaster	Hull, Warren, House	5976 Genesee Street
Lancaster	Lancaster Municipal Building	5423 Broadway
Lancaster	Lieber-Rohl Gasoline Station	5500 Broadway
Lancaster	Miller-Mackey House	5440 Broadway
Lancaster	Nowak, Dr. John, House	5539 Broadway
Lancaster	Richardson, John, House	5653 Broadway
Lancaster	US Post Office--Lancaster	5064 Broadway
Lancaster	Van Peyma, Herman B., House	5565 Broadway
Lancaster	Zuidema-Idsardi House	5556 Broadway
Lancaster vicinity	Lancaster District School No. 6	3703 Bowen Road
North Collins	Gamel Hexadecagon Barn	Shirley Road
Orchard Park	Buffalo, Rochester and Pittsburgh Railway Station	395 South Lincoln Avenue
Orchard Park	Johnson-Jolls Complex	S-4287 S. Buffalo Street
Sardinia	Rider-Hopkins Farm and Olmsted Camp	12820 Benton Road
Sardinia	Sardinia Old Town Hall	12070 Savage Road
Springville	Buffalo, Rochester & Pittsburgh Railroad Station	227 W. Main Street
Springville	Citizens National Bank	5 West Main Street
Springville	East Main--Mechanic Streets Historic District	East Main, Mechanic Streets
Springville	The Baptist Church of Springville	37 North Buffalo Street
Springville	US Post Office--Springville	75 Franklin Street
Springville vicinity	Scobey Power Plant and Dam	Scobey Hill Road at Cattaraugus Creek
Tonawanda	Kibler High School	284 Main Street
Tonawanda	Tonawanda (25th Separate Company) Armory	79 Delaware Avenue
Tonawanda	US Post Office--Tonawanda	96 Seymour Street
Williamsville	Williamsville Christian Church	5658 Main Street
Williamsville	Williamsville Junior and Senior High School	5950 Main Street
Williamsville	Williamsville Water Mill Complex	56 and 60 Spring Street
Williamsville vicinity	Reformed Mennonite Church (Former)	5178 Main Street
Williamsville vicinity	St. Mary of the Angels Motherhouse Complex	400 Mill Street

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Population

According to the US Census, the population of Erie County in 2000 was 950,265 whereas, in 2010 it was 919,040 – a decrease of approximately 3.3 percent in less than ten years. The New York Statistical Information System at Cornell University projects the County's population to continue this trend with a steady decrease thereafter through 2040, down to a level of 769,396. **Table 3b.6** shows key County population changes between 2000 and 2010 (county-wide and for each municipality) as reported by the US Census Bureau. As of 2010 there were approximately 380,565 households in Erie County, with an average household size of 2.33. **Figure 3b.1** shows population densities across Erie County.

Table 3b.6 Erie County Population Changes <i>(Source: US Census Bureau *)</i>		
Municipality	Census Population 2000	Census Population 2010
Erie, County of	950,265	919,040
Akron, Village of	3,085	2,868
Alden, Town of	10,470	10,865
Alden, Village of	2,666	2,605
Amherst, Town of	116,510	122,366
Angola, Village of	2,266	2,127
Aurora, Town of	13,996	13,782
Blasdell, Village of	2,718	2,553
Boston, Town of	7,897	8,023
Brant, Town of	1,906	2,065
Buffalo, City of	292,648	261,310
Cheektowaga, Town of	94,019	88,226
Clarence, Town of	26,123	30,673
Colden, Town of	3,323	3,265
Collins, Town of	8,307	6,601
Concord, Town of	8,526	8,494
Depew, Village of	16,629	15,303
East Aurora, Village of	6,673	6,236
Eden, Town of	8,076	7,688
Elma, Town of	11,304	11,317
Evans, Town of	17,594	16,356
Farnham, Village of	322	382
Gowanda, Village of	2,842	2,709
Grand Island, Town of	18,621	20,374
Hamburg, Town of	56,259	56,936
Hamburg, Village of	10,116	9,409
Holland, Town of	3,603	3,401
Kenmore, Village of	16,426	15,423
Lackawanna, City of	19,064	18,141
Lancaster, Town of	39,019	41,604
Lancaster, Village of	11,188	10,352
Marilla, Town of	5,709	5,327
Newstead, Town of	8,404	8,594
North Collins, Town of	3,376	3,523
North Collins, Village of	1,079	1,232
Orchard Park, Town of	27,637	29,054
Orchard Park, Village of	3,294	3,246

**SECTION 3B – RISK ASSESSMENT:
IDENTIFICATION AND CHARACTERIZATION OF ASSETS**

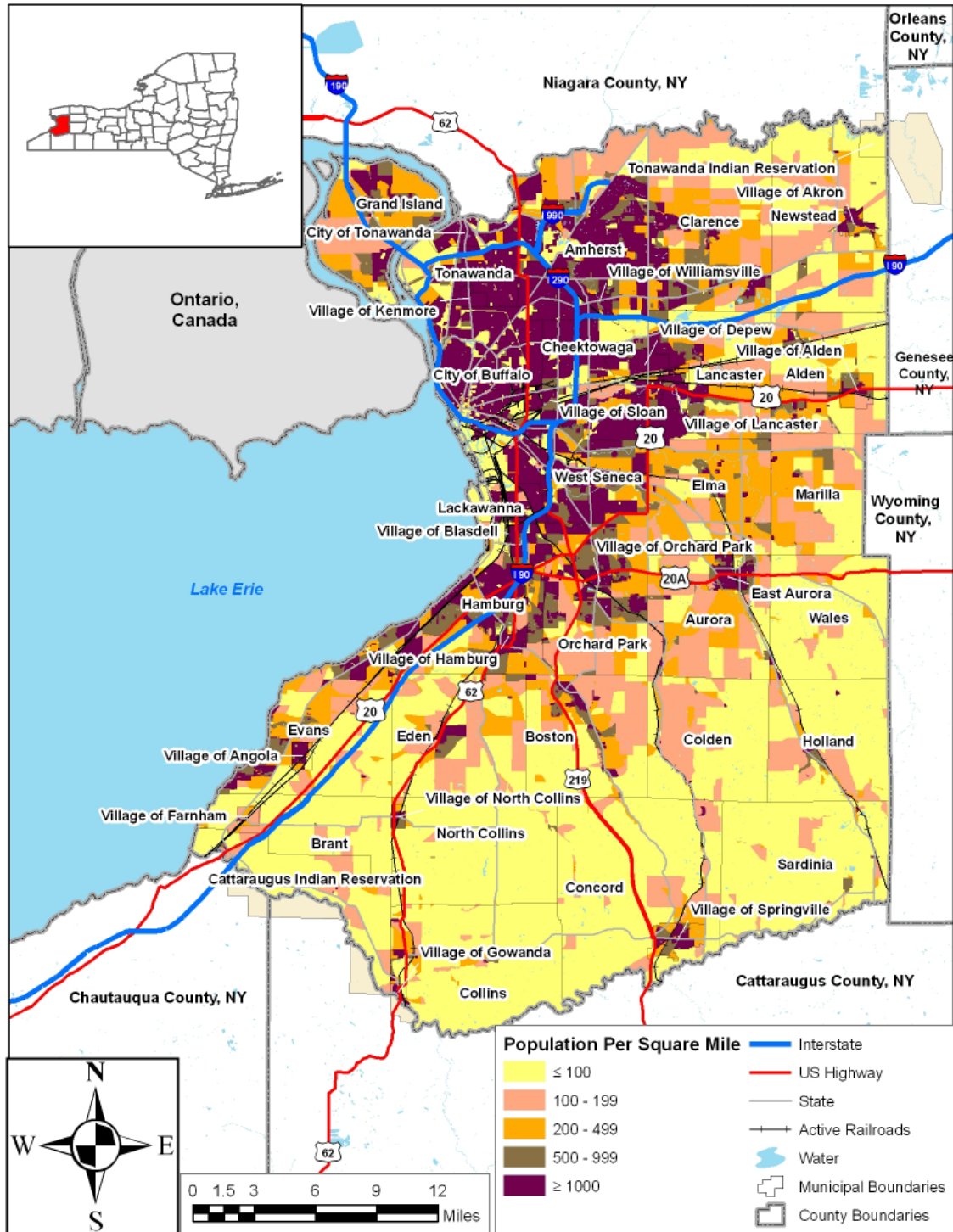
Table 3b.6 Erie County Population Changes (Source: US Census Bureau *)		
Municipality	Census Population 2000	Census Population 2010
Sardinia, Town of	2,692	2,775
Sloan, Village of	3,775	3,661
Springville, Village of	4,252	4,296
Tonawanda, City of	16,136	15,130
Tonawanda, Town of	78,115	73,567
Wales, Town of	2,960	3,005
West Seneca, Town of	45,920	44,711
Williamsville, Village of	5,573	5,300

** County Totals shown above also include residents of the Cattaraugus and Tonawanda Reservations. Town totals include population of Villages within their respective borders.*

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SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

Figure 3b.1 – Erie County Population Densities



SOURCE: ESRI, U.S. Counties, 2005; New York Major Roads, 2000; Erie County Municipal Boundaries, Erie County Street Centerlines, 2010; U.S. Census Bureau, Population Data, 2000; Census Railroads, New York State, 2001; Area Hydrography, NHD, USGS.

SECTION 3B – RISK ASSESSMENT: IDENTIFICATION AND CHARACTERIZATION OF ASSETS

For the purposes of this plan, “vulnerable” has been taken to mean residents of the county aged under five or over 65 years. Compared to the majority of the county population, people of these ages are assumed to require extra medical care and additional resources, particularly in the event of emergency evacuation. When viewed in combination with the data in **Table 3b.6** and subsequent assessments of assets in individual hazard areas, this data may be used to highlight areas which may benefit from increased focus in the development of mitigation goals and strategies.

Table 3b.7 indicates that about 21 percent of the population of the planning area can be termed “vulnerable”, and that the municipalities with the highest proportion of vulnerable residents are the Villages of East Aurora and Orchard Park (29 and 28 percent, respectively), while Town and Village of North Collins have the lowest (with 13 and 15 percent, respectively). Within the vulnerable sector of the population, the percentage of seniors outnumbers that of small children in every municipality, without exception, by an average of nearly three to one.

In Erie County overall, small children account for 5.4 percent of the population, while seniors account for 15.6 percent.

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**SECTION 3B – RISK ASSESSMENT:
IDENTIFICATION AND CHARACTERIZATION OF ASSETS**

**Table 3b.7
Vulnerable Sectors of the Population by Municipality (2005-2009 Census Estimate)**

Municipality	Total Population	Under 5 Years	Percent of Municipal Total	65 Years and over	Percent of Municipal Total	Total Vulnerable Population	Percent of Municipal Total
Akron, Village of	3,002	172	5.7%	376	12.5%	548	18.2%
Alden, Town of	10,314	393	3.8%	1,638	15.9%	2,031	19.7%
Alden, Village of	2,560	98	3.8%	368	14.4%	466	18.2%
Amherst, Town of	115,640	6,258	5.4%	20,054	17.3%	26,312	22.7%
Angola, Village of	2,117	123	5.8%	342	16.2%	465	22.0%
Aurora, Town of	13,558	829	6.1%	2,643	19.5%	3,472	25.6%
Blasdell, Village of	2,511	129	5.1%	316	12.6%	445	17.7%
Boston, Town of	7,820	453	5.8%	1,264	16.2%	1,717	22.0%
Brant, Town of	1,956	103	5.3%	323	16.5%	426	21.8%
Buffalo, City of	273,335	16,565	6.1%	34,099	12.5%	50,664	18.6%
Cheektowaga, Town of	88,450	3,989	4.5%	18,041	20.4%	22,030	24.9%
Clarence, Town of	27,938	1,514	5.4%	4,336	15.5%	5,850	20.9%
Colden, Town of	3,288	167	5.1%	417	12.7%	584	17.8%
Collins, Town of	7,096	223	3.1%	703	9.9%	926	13.0%
Concord, Town of	8,427	438	5.2%	1,446	17.2%	1,884	22.4%
Depew, Village of	15,433	661	4.3%	2,818	18.3%	3,479	22.6%
East Aurora, Village of	6,287	392	6.2%	1,433	22.8%	1,825	29.0%
Eden, Town of	7,762	244	3.1%	1,083	14.0%	1,327	17.1%
Elma, Town of	11,265	451	4.0%	1,978	17.6%	2,429	21.6%
Evans , Town of	16,937	824	4.9%	2,635	15.6%	3,459	20.5%
Farnham, Village of	243	10	4.1%	29	11.9%	39	16.0%
Gowanda, Village of	2,916	127	4.4%	438	15.0%	565	19.4%
Grand Island, Town of	18,879	990	5.2%	2,156	11.4%	3,146	16.6%
Hamburg, Town of	55,921	3,013	5.4%	8,304	14.8%	11,317	20.2%
Hamburg, Village of	9,446	485	5.1%	1,486	15.7%	1,971	20.8%
Holland, Town of	3,504	146	4.2%	475	13.6%	621	17.8%
Kenmore, Village of	15,146	825	5.4%	2,360	15.6%	3,185	21.0%
Lackawanna, City of	17,746	791	4.5%	3,167	17.8%	3,958	22.3%
Lancaster, Town of	40,265	2,521	6.3%	5,789	14.4%	8,310	20.7%
Lancaster, Village of	11,199	616	5.5%	1,908	17.0%	2,524	22.5%

**SECTION 3B – RISK ASSESSMENT:
IDENTIFICATION AND CHARACTERIZATION OF ASSETS**

**Table 3b.7
Vulnerable Sectors of the Population by Municipality (2005-2009 Census Estimate)**

Municipality	Total Population	Under 5 Years	Percent of Municipal Total	65 Years and over	Percent of Municipal Total	Total Vulnerable Population	Percent of Municipal Total
Marilla, Town of	5,597	198	3.5%	765	13.7%	963	17.2%
Newstead, Town of	8,382	424	5.1%	1,282	15.3%	1,706	20.4%
North Collins, Town of	3,276	174	5.3%	453	13.8%	627	19.1%
North Collins, Village of	1,051	51	4.9%	106	10.1%	157	15.0%
Orchard Park, Town of	28,272	1,353	4.8%	4,649	16.4%	6,002	21.2%
Orchard Park, Village of	3,074	15	4.9%	704	22.9%	719	27.8%
Sardinia, Town of	2,671	160	6.0%	299	11.2%	459	17.2%
Sloan, Village of	3,484	138	4.0%	646	18.5%	784	22.5%
Springville, Village of	4,212	231	5.5%	858	20.4%	1,089	25.9%
Tonawanda, Town of	72,365	3,985	5.5%	13,405	18.5%	17,390	24.0%
Tonawanda, City of	14,949	751	5.0%	2,378	15.9%	3,129	20.9%
Wales, Town of	2,855	166	5.8%	448	15.7%	614	21.5%
West Seneca, Town of	43,935	2,308	5.3%	8,571	19.5%	10,879	24.8%
Williamsville, Village of	5,213	230	4.4%	1,125	21.6%	1,355	26.0%
<i>County Total</i>	<i>914,200</i>	<i>49,478</i>	<i>5.4%</i>	<i>143,019</i>	<i>15.6%</i>	<i>192,497</i>	<i>21.0%</i>

** County Totals shown above also include residents of the Cattaraugus and Tonawanda Reservations. Town totals include population of Villages within their respective borders.*

SECTION 3c - RISK ASSESSMENT: *DAMAGE ESTIMATES*

Methodology

This plan section builds upon the information provided in the Hazard Profiles section (Section 3A) and Asset Identification and Characterization section (Section 3B) by assessing the potential impact, exposure, and amount of damages that could potentially be expected to be caused by each identified hazard event. The primary objective of this portion of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard, by jurisdiction. In so doing, the County and each of its municipalities may better understand their own unique risks to identified hazards and be better prepared to evaluate and prioritize unique hazard mitigation actions for their communities. This plan aims to assess vulnerability to various hazards within the limitations of the available data, where generally accepted measures of vulnerability are established. GIS parcel data included assessed values for land and total assessed values; assessed values for improvements were calculated by subtracting the land value from the total value. Expanding upon the parcel data in the County's GIS to include such information as building square footage, year built, type, foundation type, and condition, would allow for a more accurate assessment of vulnerability. Therefore, the Planning Committee has considered actions in this regard. Please see further sections of this plan for additional information on actions considered and ultimately selected.

ATMOSPHERIC HAZARDS

Extreme Temperatures.

Impacts – Extreme Temperatures

Extreme temperatures are primarily a threat to human life and health, though they are also hazardous to livestock and agricultural crops and occasionally might threaten property and infrastructure. They can also exacerbate the impact of other hazards such as severe weather events that cause widespread power outages. Emergency responders are often called upon to work with public officials/non-profit agencies for heating/cooling venues, and to transport vulnerable sectors of the population to such venues. Extreme temperatures are likely to result in relatively minor impacts in Erie County, with very few injuries (if any), minor and sporadic property damage, and minimal disruption on quality of life. Temporary shutdown of critical facilities to reduce energy usage or due to the fact that employees may not be able to get to the facility is possible. Common impacts associated with extreme heat in Erie County include: injuries associated with swimming to escape extreme heat, and individuals seeking medical treatment for heat related illness (i.e., for heat stress, exhaustion, heat stroke, etc.), and power outages from an associated strain on electrical networks. Cooling centers are typically opened, and schools altering class schedules and/or activities to ensure student safety. Extreme heat events typically impact the elderly and disadvantaged most heavily. Primary impacts of concern for extreme cold temperatures include the life-threatening effects of overexposure hypothermia on people, particularly the elderly and disadvantaged. Other significant impacts include strains on livestock and agriculture.

Exposure and Estimated Damages – Extreme Temperatures

The extreme temperature hazard area encompasses the entirety of Erie County and, therefore, all assets are exposed to this hazard. All existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted in addition to crops.

While all of Erie County is exposed to extreme temperatures, existing buildings, infrastructure and critical facilities are not considered significantly vulnerable to substantial damage caused by extreme heat or cold events. Therefore, any estimated property losses associated with these hazards are anticipated to be

minimal across the planning area. Extreme temperatures do, however, present a significant life and safety threat to the planning area's population. According to estimated 2006 US Census data reported in the New York State Hazard Mitigation Plan (NYSHMP), the percentage of the Erie County population most susceptible to extreme temperatures (under 5 years and over 65 years) is 20.9 percent, slightly higher than the statewide average of 19.5 percent.

Heat casualties are usually caused by lack of adequate air conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed, who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being.

Casualties resulting from extreme cold may result from a lack of adequate heat, carbon monoxide poisoning from unsafe heat sources and frostbite. The most vulnerable populations to cold casualties are the elderly or infirmed as well as low income households, as they may not be able to afford to operate a heat source on a regular basis and may not have immediate family or friends to look out for their well-being.

Crop losses resulting from extreme temperatures are certainly possible; however, the NCDC records zero dollars in crop losses for historic occurrences for both extreme temperature and drought queries. Therefore, readily available data precludes this plan's inclusion of an average annual crop loss estimate, though in terms of exposure, it is noted that roughly 15 percent of the County's land area is dedicated to agriculture. In terms of market value of products sold, about 36 percent of products sold in the county are from crop sales (\$41.6 million) and 64 percent (\$75.4 million) are from livestock sales. According to the 2007 Census of Agriculture there were 1,215 farms in Erie County, each producing an average of about \$34,675 in crops per year. Even if average annual damages could be estimated, methods are not in existence today for protecting acres of exposed crops from the elements to which they are inherently exposed, and it is not possible to mitigate crop losses from temperature extremes at this time.

Given the lack of historical data and limited likelihood for structural losses resulting from extreme heat or cold occurrences in the planning area, and that placing dollar damage amounts on non-structural costs, such as damages to human health, are beyond the scope of this study, annualized economic losses for each municipality in the county due to extreme temperatures are currently considered to be unquantifiable, but most likely negligible.

Extreme Wind

Impacts – Extreme Wind

Impacts associated with extreme wind in Erie County can be critical. Multiple deaths/injuries are possible, large portions of property in the affected area can be damaged or destroyed (depending on the nature of the event), and a complete shutdown of critical facilities for more than one week could all be possible, depending on the type of wind event and the nature of the event. Extreme winds pose a significant threat to lives, property, vital utilities, and infrastructure due to direct wind forces but also flying debris, such as rocks, lumber, fuel drums, sheet metal and loose gear of any type that can be picked up by the wind and hurled with great force. Some extreme wind events can be forecasted; others are completely unpredictable. Extreme winds also down trees and power lines that often result in power outages across an affected area. Emergency responders are called up for evacuations, road closures, and attending to the injured. Flying debris, in extreme wind events, can cause secondary impacts. Trees can be downed, buildings can be damaged. High winds can directly damage private property as well as roads and bridges, schools, hospitals, and other types of critical facilities and utilities and communications facilities. In addition, impaired access to these facilities during extreme wind events can cause secondary, indirect damages.

Exposure and Estimated Damages – Extreme Wind

The extreme wind hazard area encompasses the entirety of Erie County and, therefore, all assets are exposed to this hazard. All existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted.

Sufficient data was not available at the time of the study to estimate detailed damages due to extreme winds. At this time, vulnerability is being expressed as the value of improvements exposed to the hazard as defined in the “Hazard Profiles” section. Because it cannot be predicted where extreme winds may occur, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted.

First, while FEMA methodologies do exist to estimate damages due to extreme wind, specific information is required for buildings in order to employ these methodologies, such as type of construction and details on any existing protective features. At the time of plan preparation, this data was not available as part of GIS datasets within Erie County and was not readily available from other sources.

Second, having even the year built data for each structure, one would be able to highlight structures built before codes and standards were adopted to make buildings more resistant to wind damage, thus being better candidates for mitigation. Without the year-built data, this cannot be done.

Sufficient historical data regarding events and associated losses was not available to make even the roughest of estimates of potential future losses. The NCDC attributes roughly \$34.2 million in damages to Erie County from high wind and thunderstorm wind events over the 18 year period of record from 1993 through 2011. This is equivalent to \$1.9 million per year county-wide, and about \$43,200 per year in each municipality (assuming an equal distribution). However, further research into the event records behind this total reveals three key limitations in the data. First, it is apparent that the NCDC data set (and the \$34.2 million in damages, in particular) includes a significant amount of damages that were incurred in affected areas outside of Erie County, thus overestimating the damages incurred within Erie County itself. Second, and in contrast to the overestimation just discussed, it is also apparent that the NCDC data set (and the \$34.2 million in damages, in particular) in some ways underestimates damages by failing to include all losses actually incurred in affected areas within Erie County itself. Many event records describe damages within Erie County qualitatively; however, the record itself tallies zero dollars in damages to property/crops. Given these data constraints, there is no way to accurately quantify the damages per event. Third, for the vast majority of event records, dollar damages are not tied to specific municipalities within the County.

Looking next to the SHELDER database, it is beneficial that this dataset is somewhat more robust. Nearly 550 storm events featuring high winds affecting Erie County were recorded between 1960 and 2010, resulting in approximately \$45.3 million in damages to property and crops across the County. Over the 50 year period of record this is equivalent to roughly \$906,000 per year in average annual damages county-wide, and \$20,600 in each municipality (assuming an equal distribution). Similar to the NCDC dataset, however, there are key limitations in the data affecting the quality of these estimates. Reported damages are storm totals, and can be inclusive of damages caused by hazards other than wind (i.e., flooding, hail, snow, lightning). In addition, the database does not provide descriptions or locations of the impacts of individual events, and dollar damages are not tied to specific municipalities within the County.

Given the nature of historical data and documented structural losses resulting from extreme wind occurrences in the planning area, it is not possible to extract from existing datasets an accurate quantification of the potential annual structural losses over a long period of time in Erie County’s municipalities. However, while unquantifiable, these losses are potentially significant on an average annual basis for municipalities in the planning area.

If more detailed information should become available in the future, it should be utilized for loss estimates incorporated into future updates of the plan. While one could make some blanket assumptions at this time to enable the use of various tools for loss estimation, this would be unlikely to yield meaningful results.

Tornados

Impacts - Tornados

Tornados are nature's most violent storms. The most intense tornados can cause fatalities and catastrophic damage to both trees and the built environment in a matter of seconds. The number deaths, injuries, and dollar amount of damages can fluctuate drastically depending on the severity of the tornado and the degree and type of development in the damage path. Emergency responders are called upon for search and rescue, to tend to the injured, assist in evacuations, and to close roads and direct traffic. Transportation, communications, and the general operation of government could be affected by an incident. Property damage can be significant within the tornado's path. Trees can be damaged or destroyed. Power outages can occur. These impacts tend to be felt in rather limited areas, due to the nature of the tornado hazard itself (tornados with limited widths and path lengths after touchdown). The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings and particularly manufactured homes.

Exposure and Estimated Damages – Tornados

The tornado hazard area encompasses the entirety of Erie County and, therefore, all assets are exposed to this hazard. All existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted.

For the purpose of estimating annual tornado damages at this time, we have evaluated the NOAA NCDC and SHELDS databases for tornado events in the full period for which records were available for Erie County (1957-2011). Eighteen significant tornados in Erie County are reported during this 54 year window – seven of magnitude F0, six of magnitude F1, four of magnitude F2, and one of magnitude F3. The NCDC and SHELDS combined databases record that these events resulted in a total of approximately \$4.5 million in property damages, or approximately \$83,300 in average annual damages county-wide over the 54 year period of record. As a proportion of the total value of improved property in Erie County, this represents estimated damages to 0.000173 percent of the improved property in the County on an annual basis. Applying this same percentage uniformly across the County (since tornados can occur at any location, and there is not a delineable tornado hazard area) produces the estimated annual loss figures presented in Table 3c.1, which are quite negligible when considered on an average annual basis, while particular event damages could be quite significant.

Because it cannot be predicted where a tornado may touch down, all existing and future buildings, facilities, and populations are considered to be exposed to this hazard and could potentially be impacted.

**Table 3c.1
Estimated Annual Average Damages – Tornado**

Jurisdiction	Total Value of Improvements	Estimated Annual Percent Damages	Distributed Average Annual Loss Estimate, Tornado
Akron, Village of	\$147,386,383	0.000173%	\$255
Alden, Town of	\$596,764,911	0.000173%	\$1,031
Alden, Village of	\$113,968,804	0.000173%	\$197
Amherst, Town of	\$8,287,199,614	0.000173%	\$14,317

SECTION 3C – RISK ASSESSMENT: DAMAGE ESTIMATES

Table 3c.1
Estimated Annual Average Damages – Tornado

Jurisdiction	Total Value of Improvements	Estimated Annual Percent Damages	Distributed Average Annual Loss Estimate, Tornado
Angola, Village of	\$70,253,637	0.000173%	\$121
Aurora, Town of	\$732,629,812	0.000173%	\$1,266
Blasdell, Village of	\$105,746,861	0.000173%	\$183
Boston, Town of	\$395,564,101	0.000173%	\$683
Brant, Town of	\$80,726,326	0.000173%	\$139
Buffalo, City of	\$7,836,060,944	0.000173%	\$13,538
Cattaraugus Reservation	\$0	0.000173%	\$0
Cheektowaga, Town of	\$3,843,969,994	0.000173%	\$6,641
Clarence, Town of	\$2,451,434,606	0.000173%	\$4,235
Colden, Town of	\$210,932,688	0.000173%	\$364
Collins, Town of	\$140,401,209	0.000173%	\$243
Concord, Town of	\$266,337,175	0.000173%	\$460
Depew, Village of	\$687,275,077	0.000173%	\$1,187
East Aurora, Village of	\$502,982,763	0.000173%	\$869
Eden, Town of	\$508,945,663	0.000173%	\$879
Elma, Town of	\$963,279,568	0.000173%	\$1,664
Evans, Town of	\$688,158,533	0.000173%	\$1,189
Farnham, Village of	\$9,217,429	0.000173%	\$16
Gowanda, Village of	\$181,711,307	0.000173%	\$314
Grand Island, Town of	\$1,374,192,506	0.000173%	\$2,374
Hamburg, Town of	\$2,856,457,549	0.000173%	\$4,935
Hamburg, Village of	\$529,422,415	0.000173%	\$915
Holland, Town of	\$198,103,906	0.000173%	\$342
Kenmore, Village of	\$550,842,370	0.000173%	\$952
Lackawanna, City of	\$491,989,230	0.000173%	\$850
Lancaster, Town of	\$1,660,594,610	0.000173%	\$2,869
Lancaster, Village of	\$450,761,881	0.000173%	\$779
Marilla, Town of	\$311,762,654	0.000173%	\$539
Newstead, Town of	\$275,242,465	0.000173%	\$476
North Collins, Town of	\$98,650,414	0.000173%	\$170
North Collins, Village of	\$37,194,174	0.000173%	\$64
Orchard Park, Town of	\$2,336,738,931	0.000173%	\$4,037
Orchard Park, Village of	\$236,478,010	0.000173%	\$409
Sardinia, Town of	\$171,167,007	0.000173%	\$296
Sloan, Village of	\$88,611,517	0.000173%	\$153
Springville, Village of	\$251,444,560	0.000173%	\$434
Tonawanda, City of	\$554,227,967	0.000173%	\$957
Tonawanda Reservation	\$0	0.000173%	\$0
Tonawanda, Town of	\$3,937,290,613	0.000173%	\$6,802
Wales, Town of	\$184,189,527	0.000173%	\$318
West Seneca, Town of	\$2,487,649,101	0.000173%	\$4,298
Williamsville, Village of	\$313,415,097	0.000173%	\$541
Erie, County of	\$48,217,373,909	0.000173%	\$83,300

Winter Storms / Ice Storms

Impacts – Winter Storms / Ice Storms

A severe winter storm can adversely affect roadways, utilities, business activities and can cause loss of life, frostbite, or freezing. The most common effect of winter storms and ice storms is traffic accidents, interruptions in power supply and communications; and the failure of inadequately designed and/or maintained roofing systems. Power outages and temperatures below freezing for extended periods of time can cause pipes to freeze and burst. Heavily populated areas tend to be significantly impacted by losses of

power and communications systems due to downed lines. Distribution lines can be downed by the weight of snow or ice, or heavy winds. When limbs and lines fall on roadways, transportation routes can be adversely affected and buildings and automobiles can be damaged. Heavy snow loads can cause roof collapse for residential, commercial, and industrial structures in cases of inadequate design and/or maintenance. Severe winter storms can also cause Lake Erie coastal flooding, coastal erosion, and wave action. If significant snowfall amounts melt quickly, inland flooding can occur as bankfull conditions are exceeded or in areas of poor roadway drainage. The impacts of snow and ice storms in the planning area are more likely to be major disruptions to transportation, commerce and electrical power as well as significant overtime work for government employees, rather than large scale property damages and/or threats to human life and safety. The severity of the effects of winter storms and ice storms increases as the amount and rate of precipitation increase. In addition, storms with a low forward velocity are in an area for a longer duration and become more severe in their affects. Storms that are in full force during the morning or evening rush hours tend to have their affects magnified because more people are out on the roadways and directly exposed. Erie County's more rural jurisdictions could be expected to be impacted more by heavy snow and freezing rain due to access transportation issues and distances from major population centers and additional emergency response resources.

Exposure and Estimated Damages – Winter Storms / Ice Storms

The winter storm / ice storm hazard area encompasses the entirety of Erie County and, therefore, all assets are exposed to this hazard. All existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted.

Sufficient data was not available at the time of the study to estimate detailed damages due winter storms. At this time, vulnerability is being expressed as the value of improvements exposed to the hazard as defined in the "Hazard Profiles" section.

Sufficiently detailed data regarding the damages attributed to the numerous winter storms recorded by NCDC and SHELDUS in Erie County was not available at the time of the study to adequately estimate damages due to winter storms. The NCDC database records 110 significant snow and ice events between 1993 and 2011 causing approximately \$95 million in property damages, while the SHELDUS database records 265 events from 1960 to 2010 causing only \$55 million in damages. It is not clear why there is such a discrepancy in the reported damages (SHELDUS reports about half of the damages for about twice as many events over a much longer period of record). Damages reported in each database often apply to a wide region covering multiple affected counties and further breakdowns giving damages by individual counties or municipalities are not readily available from NCDC, SHELDUS or any other source.

Since neither standard loss estimating methodologies for winter storms or the required data are readily available, we have determined that while annual losses due to winter/ice storms are potentially significant, though they are currently unquantifiable.

Given the nature of historical data and documented structural losses resulting from winter storm occurrences in the planning area, it is not possible to extract from existing datasets an accurate quantification of the potential annual structural losses over a long period of time in Erie County's municipalities. However, while unquantifiable, these losses are potentially significant on an average annual basis for municipalities in the planning area.

If more detailed information should become available in the future, it should be utilized for loss estimates incorporated into future updates of the plan. While one could make some blanket assumptions at this time to enable the use of various tools for loss estimation, this would be unlikely to yield meaningful results.

HYDROLOGIC HAZARDS

Coastal Erosion

Impacts – Coastal Erosion

Death and injury are generally not associated with coastal erosion along Lake Erie; however, it can cause the destruction of buildings and infrastructure as land is eroded away, and represents a major threat to the local economies of coastal communities that rely on the financial benefits of recreational beaches. Natural recovery from erosion can take years to decades. If a beach and dune system does not recover quickly enough naturally, coastal and upland property may be exposed to further damage in subsequent coastal erosion and flooding events. Human actions to supplement natural coastal recovery, such as beach nourishment, dune stabilization and shoreline protection structures (sea walls, groins, jetties, etc.) can mitigate the hazard of coastal erosion, but may exacerbate it under some circumstances.

Exposure and Estimated Damages – Coastal Erosion

The coastal erosion hazard is a relatively slow natural process occurring over the long term, with occasional major impacts from episodic natural events such as severe storms.

The NYSDEC has mapped Coastal Erosion Hazard Areas in the Towns of Hamburg, Brant and Evans. In all cases, the landward limit of the erosion hazard area is mapped at the nearshore, beaches, bluffs, primary dunes, and secondary dunes. No areas have been noted as Structural Hazard Areas, because the recession rate is either less than one foot per year or cannot be accurately established.

Current standard loss estimation methodologies for erosion damages are not available to quantify average annual coastal erosion damages. Vulnerability could be expressed in terms of the value of property exposed if the CEHA lines were available in GIS to overlay upon County parcel data, or if rates of erosion were known. However, with only paper/PDF versions of the CEHA mapping available at this time, and no known average annual erosion rates in this area, even a rudimentary exposure analysis could not be conducted in a manner that would yield meaningful estimates of erosion damages. If and when the CEHA mapping becomes available in GIS, or if erosion rates become available, this section should be updated accordingly during future plan updates.

At this time, the estimated number of buildings potentially exposed was generated by comparing the 1988 CEHAs (PDF files) against 2008 aerial photography (as viewed on Google Earth) to generate an approximate tally of buildings either lakeward of, or intersected by, the CEHA. In this case, the rough structure counts are: three in the Town of Brant, 36 in the Town of Evans, and 14 in the Town of Hamburg. Given that these numbers of buildings are very small compared to the total number of buildings in each municipality, the average annual damages due to coastal erosion in each municipality are expected to be negligible.

Flooding

Impacts – Flooding

Flooding can cause widespread damage throughout rural and urban areas, causing loss of life, injury, and severe structural damage to buildings, damaged or destroyed building contents, loss of function for flooded facilities, flooded roadways causing lengthy detour times and increased emergency response times, deposition of debris in and out of channels; damages to utility and communication networks; and agriculture. Flooding can cause damages to property, infrastructure, agriculture, and the environment. Local communities often bear the brunt of costs for emergency

responders to provide guidance during the response phase, and lead the community through what is often a long recovery process thereafter. Buildings, roads, and bridges can be damaged or destroyed. Crops can be lost when farm fields are flooded. Functional downtime of businesses and/or damage to merchandise and equipment can have staggering impacts. Flooding can also cause sewage to backup into houses through drainpipes where backflow valves are not present. Unanchored fuel tanks can be easily moved by floodwaters, causing environmental damage. When government facilities or critical facilities such as police stations, fire stations, hospitals, etc. are flooded – or where access routes to these structures are impassable due to floodwaters – impacts are even greater, with the community's ability to effectively and efficiently govern, provide emergency services and critical care for the injured. While recovery from these impacts can be quick for small-scale, short-duration events; larger events can cripple a community for weeks, months, and years to follow.

Exposure – Flooding

FEMA's DFIRM flood mapping was overlaid upon the Erie County GIS parcel mapping to identify the flood risk areas for all municipalities in Erie County, and the collated data is presented in **Tables 3c.2 and 3c.3**. In the absence of GIS size and location data for individual structures, impacted improved property values were calculated by adjusting the structure values according to the percentage of the improved parcel intersected by the flood risk zone. A more detailed breakdown of property exposed to the flood hazard by land use types is presented in Appendix A.

In total, only around eight percent of the County area lies within high or moderate flood risk zones, according to current DFIRM mapping data. The Town of Clarence has the highest proportion of land area within a high flood risk zone, followed by the Town of Amherst, Village of Blasdell, and City of Lackawanna. Several municipalities have no proportions of land within high or medium risk flood zones. These include; the Villages of Farnham, Kenmore, Sloan, and North Collins, and the Town of North Collins.

The GIS analysis indicates that the Village of Gowanda, City of Lackawanna and Town of Alden have the greatest proportions of improved property values in high flood risk zones, with 15.6, 11.4 and 10.7 percent in each municipality, respectively. For almost every other municipality in the County, the proportion of improved property within the mapped high flood risk zone is less than seven percent. The Town of Amherst has the greatest dollar amount of improved property within high flood risk zone (just under \$593 million), followed by the City of Buffalo and the Towns of Clarence and West Seneca, each with about \$140 to \$147 million.

Appendix 1 of the New York State Hazard Mitigation Plan of January 2008 contains estimates of improved property values in the 100-year floodplain for all municipalities derived from Q3 data similar to those presented in Table 3c.3 and Appendix A. The analyses presented in this plan have used more up to date improved property data sourced directly from the County and the latest local equalization rates from the State office of Real Property Services. Minor differences in analysis methodology¹ notwithstanding, this approach is considered to result in a more accurate and up to date depiction of the exposure to the flood hazard than that presented in the January 2008 State Plan. Figure 3-52 from the New York State Plan, which summarizes residential property exposure in the 100-year floodplain for Erie County, has been included in Appendix A for comparison. Some additional discussion of the methodology used to analyze the value of improved property exposed to delineable hazards is included in Section 3b.

¹ Note: The methodology used to compile the State Plan figures differed from that used in this plan in that it was based on the inclusion of the full improved value of all parcels whose center points fell inside the Q3 flood hazard zones, while the analyses presented in Table 3a.12 counted all parcels which were intersected at any point by the DFIRM hazard area shape files and applied the percentage of the parcel area within the hazard area to the total improved value associated with that value to account for the uncertainty regarding the location of the structure(s) within each parcel, since without building footprint data it cannot be automatically assumed that all improvements lie exactly at the center of their associated parcels.

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.2
Summary of FEMA DFIRM Flood Data by Municipality: Land in Hazard Areas ***

Municipality	Total Land Area (Acres)	Land in High Flood Risk Areas (Acres)	Land in Moderate Flood Risk Areas (Acres)	Land in Low Flood Risk Areas (Acres)	Land in High Flood Risk Areas (%)	Land in Moderate Flood Risk Areas (%)	Land in Low Flood Risk Areas (%)
		A, AE,AH,AO	X500	X	A, AE,AH,AO	X500	X
Akron, Village of	1,228.0	101.7	18.6	1,107.7	8.3%	1.5%	90.2%
Alden, Town of	20,394.4	946.5	92.1	19,355.8	4.6%	0.5%	94.9%
Alden, Village of	1,711.5	89.8		1,621.7	5.2%	0.0%	94.8%
Amherst, Town of	33,488.6	6,287.0	8,267.6	18,934.1	18.8%	24.7%	56.5%
Angola, Village of	869.6	60.6	2.7	806.3	7.0%	0.3%	92.7%
Aurora, Town of	21,739.4	645.1	100.0	20,994.3	3.0%	0.5%	96.6%
Blasdell, Village of	635.6	104.0	62.1	469.5	16.4%	9.8%	73.9%
Boston, Town of	22,926.1	342.2	33.7	22,550.2	1.5%	0.1%	98.4%
Brant, Town of	14,900.8	195.6	0.0	14,684.4	1.3%	0.0%	98.5%
Buffalo, City of	26,275.3	1,903.8	584.9	23,784.3	7.2%	2.2%	90.5%
Cattaraugus Indian Reservation	16,458.1	0.0		0.0	0.0%	0.0%	0.0%
Cheektowaga, Town of	16,292.4	1,081.6	929.4	14,281.4	6.6%	5.7%	87.7%
Clarence, Town of	34,321.3	8,341.6	1,607.6	24,372.1	24.3%	4.7%	71.0%
Colden, Town of	22,830.7	193.4	17.5	22,619.8	0.8%	0.1%	99.1%
Collins, Town of	30,405.8	740.8	18.5	29,589.1	2.4%	0.1%	97.3%
Concord, Town of	42,641.2	852.1	5.2	41,763.1	2.0%	0.0%	97.9%
Depew, Village of	3,228.1	274.7	66.4	2,887.1	8.5%	2.1%	89.4%
East Aurora, Village of	1,590.2	108.9	230.5	1,250.8	6.8%	14.5%	78.7%
Eden, Town of	25,517.9	256.3	1.1	25,260.5	1.0%	0.0%	99.0%
Elma, Town of	22,116.0	1,590.4	137.3	20,388.3	7.2%	0.6%	92.2%
Evans, Town of	25,727.4	1,291.4	155.4	24,226.9	5.0%	0.6%	94.2%
Farnham, Village of	652.0	0.0		652.0	0.0%	0.0%	100.0%
Gowanda, Village of	359.8	35.6	8.2	316.0	9.9%	2.3%	87.8%
Grand Island, Town of	18,180.7	645.5	80.6	17,454.6	3.6%	0.4%	96.0%
Hamburg, Town of	24,224.8	1,305.3	226.6	22,659.0	5.4%	0.9%	93.5%
Hamburg, Village of	1,523.6	23.2	0.8	1,499.7	1.5%	0.1%	98.4%

**Table 3c.2
Summary of FEMA DFIRM Flood Data by Municipality: Land in Hazard Areas ***

Municipality	Total Land Area (Acres)	Land in High Flood Risk Areas (Acres)	Land in Moderate Flood Risk Areas (Acres)	Land in Low Flood Risk Areas (Acres)	Land in High Flood Risk Areas (%)	Land in Moderate Flood Risk Areas (%)	Land in Low Flood Risk Areas (%)
		A, AE,AH,AO	X500	X	A, AE,AH,AO	X500	X
Holland, Town of	22,874.0	440.0	30.1	22,403.8	1.9%	0.1%	97.9%
Kenmore, Village of	916.0	0.0		916.0	0.0%	0.0%	100.0%
Lackawanna, City of	4,231.7	693.8	687.9	2,833.4	16.4%	16.3%	67.0%
Lancaster, Town of	21,394.0	2,988.9	228.8	18,176.3	14.0%	1.1%	85.0%
Lancaster, Village of	1,758.9	174.3	30.9	1,553.8	9.9%	1.8%	88.3%
Marilla, Town of	17,546.4	607.9	74.9	16,863.6	3.5%	0.4%	96.1%
Newstead, Town of	31,404.9	3,373.2	468.7	27,563.0	10.7%	1.5%	87.8%
North Collins, Town of	27,008.7	0.0		27,008.7	0.0%	0.0%	100.0%
North Collins, Village of	501.9	0.0		501.9	0.0%	0.0%	100.0%
Orchard Park, Town of	23,807.9	697.2	88.9	23,021.7	2.9%	0.4%	96.7%
Orchard Park, Village of	863.2	71.8	9.0	782.3	8.3%	1.0%	90.6%
Sardinia, Town of	32,214.5	975.4	1.8	31,185.5	3.0%	0.0%	96.8%
Sloan, Village of	502.5	0.0		502.5	0.0%	0.0%	100.0%
Springville, Village of	2,325.0	45.3	11.0	2,268.6	1.9%	0.5%	97.6%
Tonawanda, City of	2,378.7	94.9	177.2	2,106.7	4.0%	7.4%	88.6%
Tonawanda Indian Reservation	1,158.1	0.0		0.0	0.0%	0.0%	0.0%
Tonawanda, Town of	11,172.5	237.6	460.4	10,474.5	2.1%	4.1%	93.8%
Wales, Town of	22,860.9	935.8	33.6	21,891.5	4.1%	0.1%	95.8%
West Seneca, Town of	13,742.5	1,484.2	290.8	11,967.5	10.8%	2.1%	87.1%
Williamsville, Village of	768.1	85.6	23.0	659.4	11.1%	3.0%	85.9%
Erie County, Total:	669,669.3	40,321.1	15,263.7	596,209.3	6.0%	2.3%	89.0%

* Does not include areas designated "ANI: Area Not Included" on FIRMs therefore total percentages may not add up to 100% for all communities. Including, for example, both the Cattaraugus Indian Reservation and the Tonawanda Indian Reservation.

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.3
Summary of FEMA DFIRM Flood Data by Municipality: Improved Property in Hazard Areas ***

Municipality	Total Improved Property Value	Improved Property in High Flood Risk Area	Improved Property in Moderate Flood Risk Area	Improved Property in Low Flood Risk Area	Improved Property in High Flood Risk (%)	Improved Property in Moderate Flood Risk (%)	Improved Property in Low Flood Risk (%)
		A, AE, AH, AO	X500	X	A, AE, AH, AO	X500	X
Akron, Village of	\$147,386,383	\$ 3,344,030	\$ 1,567,584	\$ 142,475,363	2.3%	1.1%	96.7%
Alden, Town of	\$596,764,911	\$ 64,128,828	\$ 4,953,644	\$ 527,381,773	10.7%	0.8%	88.4%
Alden, Village of	\$113,968,804	\$ 1,507,871	\$ -	\$ 112,460,855	1.3%	0.0%	98.7%
Amherst, Town of	\$8,287,199,614	\$ 592,995,472	\$ 1,187,881,432	\$ 6,506,238,652	7.2%	14.3%	78.5%
Angola, Village of	\$70,253,637	\$ 1,346,132	\$ 27,495	\$ 68,877,020	1.9%	0.0%	98.0%
Aurora, Town of	\$732,629,812	\$ 14,900,271	\$ 10,046,309	\$ 707,691,775	2.0%	1.4%	96.6%
Blasdell, Village of	\$105,746,861	\$ 5,486,317	\$ 1,346,923	\$ 98,913,206	5.2%	1.3%	93.5%
Boston, Town of	\$395,564,101	\$ 6,364,515	\$ 668,990	\$ 388,537,014	1.6%	0.2%	98.2%
Brant, Town of	\$80,726,326	\$ 925,851	\$ -	\$ 79,403,150	1.1%	0.0%	98.4%
Buffalo, City of	\$7,836,060,944	\$ 140,902,331	\$ 105,751,670	\$ 7,587,421,650	1.8%	1.3%	96.8%
Cattaraugus Reservation	\$0	\$ -	\$ -	\$ -	-	-	-
Cheektowaga, Town of	\$3,843,969,994	\$ 59,866,802	\$ 411,566,668	\$ 3,372,641,445	1.6%	10.7%	87.7%
Clarence, Town of	\$2,451,434,606	\$ 146,964,247	\$ 64,318,645	\$ 2,240,034,582	6.0%	2.6%	91.4%
Colden, Town of	\$210,932,688	\$ 4,471,235	\$ 416,646	\$ 206,045,418	2.1%	0.2%	97.7%
Collins, Town of	\$140,401,209	\$ 2,512,502	\$ 166,854	\$ 137,611,016	1.8%	0.1%	98.0%
Concord, Town of	\$266,337,175	\$ 3,211,493	\$ 81,797	\$ 262,898,090	1.2%	0.0%	98.7%
Depew, Village of	\$687,275,077	\$ 21,723,037	\$ 12,141,042	\$ 653,402,815	3.2%	1.8%	95.1%
East Aurora, Village of	\$502,982,763	\$ 18,201,854	\$ 104,813,532	\$ 379,956,283	3.6%	20.8%	75.5%
Eden, Town of	\$508,945,663	\$ 3,034,861	\$ 2,806	\$ 505,908,403	0.6%	0.0%	99.4%
Elma, Town of	\$963,279,568	\$ 32,043,064	\$ 5,154,808	\$ 926,084,569	3.3%	0.5%	96.1%
Evans, Town of	\$688,158,533	\$ 32,013,430	\$ 4,989,866	\$ 648,738,248	4.7%	0.7%	94.3%
Farnham, Village of	\$9,217,429	0	0	\$ 9,217,429	0.0%	0.0%	100.0%
Gowanda, Village of	\$181,711,307	\$ 28,420,864	\$ 6,435,431	\$ 146,852,232	15.6%	3.5%	80.8%
Grand Island, Town of	\$1,374,192,506	\$ 72,654,312	\$ 3,863,083	\$ 1,297,671,771	5.3%	0.3%	94.4%
Hamburg, Town of	\$2,856,457,549	\$ 48,766,374	\$ 20,969,748	\$ 2,786,458,425	1.7%	0.7%	97.5%
Hamburg, Village of	\$529,422,415	\$ 2,430,656	\$ 63,405	\$ 526,929,006	0.5%	0.0%	99.5%
Holland, Town of	\$198,103,906	\$ 6,277,741	\$ 694,783	\$ 191,125,913	3.2%	0.4%	96.5%

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.3
Summary of FEMA DFIRM Flood Data by Municipality: Improved Property in Hazard Areas ***

Municipality	Total Improved Property Value	Improved Property in High Flood Risk Area	Improved Property in Moderate Flood Risk Area	Improved Property in Low Flood Risk Area	Improved Property in High Flood Risk (%)	Improved Property in Moderate Flood Risk (%)	Improved Property in Low Flood Risk (%)
		A, AE, AH, AO	X500	X	A, AE, AH, AO	X500	X
Kenmore, Village of	\$550,842,370	0	0	\$ 550,841,099	0.0%	0.0%	100.0%
Lackawanna, City of	\$491,989,230	\$ 56,043,010	\$ 69,627,535	\$ 366,268,500	11.4%	14.2%	74.4%
Lancaster, Town of	\$1,660,594,610	\$ 75,156,583	\$ 18,529,373	\$ 1,566,930,087	4.5%	1.1%	94.4%
Lancaster, Village of	\$450,761,881	\$ 31,016,839	\$ 6,449,928	\$ 413,304,232	6.9%	1.4%	91.7%
Marilla, Town of	\$311,762,654	\$ 10,105,725	\$ 1,006,803	\$ 300,637,576	3.2%	0.3%	96.4%
Newstead, Town of	\$275,242,465	\$ 11,293,093	\$ 2,212,994	\$ 261,733,458	4.1%	0.8%	95.1%
North Collins, Town of	\$98,650,414	\$ -	0	\$ 98,650,414	0.0%	0.0%	100.0%
North Collins, Village of	\$37,194,174	0	0	\$ 37,193,882	0.0%	0.0%	100.0%
Orchard Park, Town of	\$2,336,738,931	\$ 39,302,680	\$ 7,529,591	\$ 2,289,914,765	1.7%	0.3%	98.0%
Orchard Park, Village of	\$236,478,010	\$ 6,677,999	\$ 1,448,782	\$ 228,350,175	2.8%	0.6%	96.6%
Sardinia, Town of	\$171,167,007	\$ 4,458,357	\$ 46,376	\$ 166,212,919	2.6%	0.0%	97.1%
Sloan, Village of	\$88,611,517	0	0	\$ 88,611,517	0.0%	0.0%	100.0%
Springville, Village of	\$251,444,560	\$ 3,545,181	\$ 1,738,999	\$ 246,153,511	1.4%	0.7%	97.9%
Tonawanda, City of	\$554,227,967	\$ 4,535,980	\$ 37,706,525	\$ 511,987,980	0.8%	6.8%	92.4%
Tonawanda Reservation	0	0	0	0	-	-	-
Tonawanda, Town of	\$3,937,290,613	\$ 107,705,156	\$ 92,309,526	\$ 3,737,265,775	2.7%	2.3%	94.9%
Wales, Town of	\$184,189,527	\$ 5,205,808	\$ 275,892	\$ 178,690,877	2.8%	0.1%	97.0%
West Seneca, Town of	\$2,487,649,101	\$ 147,649,344	\$ 30,724,448	\$ 2,309,265,253	5.9%	1.2%	92.8%
Williamsville, Village of	\$313,415,097	\$ 18,898,475	\$ 9,980,776	\$ 284,545,867	6.0%	3.2%	90.8%
Erie County, Total:	\$48,217,373,909	\$ 1,836,088,320	\$ 2,227,510,707	\$ 44,147,533,990	3.8%	4.6%	91.6%

* Does not include areas designated "ANI: Area Not Included" on FIRMs therefore total percentages may not add up to 100% for all communities. Including, for example, both the Cattaraugus Indian Reservation and the Tonawanda Indian Reservation.

Estimated Damages – Flooding

Sufficient data was not available at the time of the study to undertake detailed formal estimates of damages due to flooding. At this time, vulnerability is being expressed as the value of improvements in the current mapped flood hazard areas as presented in the “Hazard Profiles” section of this plan. First, while FEMA methodologies do exist to estimate damages due to flooding, specific information is required for buildings in order to employ these methodologies, such as first floor elevation, type of construction, foundation type, and details on any existing protective features. This data was not available as a part of the GIS data provided for this study.

Second, having even the year built data for each structure, one would be able to highlight structures built before codes and standards were adopted to make buildings more resistant to flood damage, thus being better candidates for mitigation. Without the year-built data, this cannot be done. If this information should become available in the future, it could be incorporated into future updates of the plan. While one could make some blanket assumptions at this time to use various tools for loss estimation, this would likely yield erroneous data. Acting upon such rough estimates could result in an unwise use of limited resources.

For the purpose of estimating annual flood damages at this time, the NOAA NCDC database has been evaluated for flood events in Erie County for the 17 year period of record between 1994 and 2011 (i.e., the period for which NCDC records flood events in Erie County in any detail), which records approximately \$24 million in property damages assumed to be specifically occurring in Erie County during this period (or about \$1,412,000 on an average annual basis). This data is limited in several ways. First, it covers a very short period of record – only 1994 to 2011. Second, of its 82 event records, a **single event on August 9, 2009 in the Village of Gowanda and surrounding areas accounts for \$15 million of the \$24 million total damages (in other words, 1.2 percent of the events account for 70 percent of the total damages reported from all events in the database). Based on the County’s flood history – which included 7 federal disaster declarations for flooding – 5 of which occurred within the same period of time as the NCDC data set, and all of which included PA and IA declarations - it seems likely that the NCDC database may not be capturing all of Erie County’s historic flood losses.**

Other readily available sources of data for flood losses in the county include FEMA NFIP records, which show that there has been a total of nearly \$8.7 million in flood insurance payments made to cover flood damage in Erie County since the first municipalities in the County joined the NFIP in 1978 (or about \$263,000 on an average annual basis). Actual property flood losses community-wide are likely to be much higher, however, since this value only includes NFIP payouts and does not include losses incurred on properties the owners of which do not participate in the NFIP, losses for which a claim was not submitted, or losses for which payment on a claim was denied. FEMA records also include a further 672 flood damage claims against the NFIP in Erie County for which no payment was made. Furthermore, as stated in the Erie County HARRP-2000, statistical experience shows that only 20% of properties in floodplain are generally insured; therefore, there could be another 80% of properties in the floodplain not reflected in these damage estimates.

Because both the NCDC database and the NFIP database appeared to be significantly undercounting historic flood damages, these two sources of data were combined for generating a rough estimate of average annual loss estimates for planning purposes. Combining these two sources of data and annualizing over the periods they cover gives annual flood damages of \$1,675,000 for the whole County. This estimate does not reflect crop losses.

Because the flood hazard is not uniform across the county, these annual damages have been distributed across the municipalities in the County based on the total value of improved property in the 1% annual

SECTION 3C – RISK ASSESSMENT: DAMAGE ESTIMATES

probability floodplain (Zones A and AE, 100-year) in each one. These scaled damages have been added to the annualized NFIP losses to derive the total damages presented in **Table 3c.4**. These estimates should be considered conservative, due to the limited amount and incomplete nature of the relevant historical data. Average annual losses should be reconsidered in future updates of this plan as more comprehensive and reliable data becomes available. Note that there are two reservations and three municipalities for which \$0 in average annual flood losses has been estimated; these are in locations where the value of improved property in the FEMA 100-year floodplain is \$0 (for the reservations, the County parcel data does not record the value of improvements on those parcels, and the FEMA floodplain mapping shows the entirety the reservation land to be Zone D (possible risk or undetermined risk); for Farnham and Kenmore, all parcels are mapped by FEMA as Zone X (outside of the 500 year floodplain); and the Town and Village of North Collins have not been mapped by FEMA.

Table 3c.4
Estimated Annual Damages – Flood
(Source: NCDC/NFIP)

Jurisdiction	Total Value of Improvements	Total Value of Improvements in the 100yr Flood Hazard Area*	Average Annual Loss Estimates, Flood
Akron, Village of	\$147,386,977	\$3,344,030	\$3,058
Alden, Town of	\$596,464,246	\$64,128,828	\$58,642
Alden, Village of	\$113,968,727	\$1,507,871	\$1,379
Amherst, Town of	\$8,287,115,556	\$591,218,606	\$540,639
Angola, Village of	\$70,250,646	\$1,346,132	\$1,231
Aurora, Town of	\$732,638,355	\$14,900,271	\$13,626
Blasdell, Village of	\$105,746,445	\$5,486,317	\$5,017
Boston, Town of	\$395,570,519	\$6,364,515	\$5,820
Brant, Town of	\$80,543,086	\$925,851	\$847
Buffalo, City of	\$7,834,075,651	\$140,902,331	\$128,848
Cattaraugus Reservation	\$0	\$0	\$0
Cheektowaga, Town of	\$3,844,074,915	\$58,873,909	\$53,837
Clarence, Town of	\$2,451,317,474	\$146,964,247	\$134,391
Colden, Town of	\$210,933,298	\$4,471,235	\$4,089
Collins, Town of	\$140,376,994	\$2,512,502	\$2,298
Concord, Town of	\$266,191,380	\$3,211,493	\$2,937
Depew, Village of	\$687,266,895	\$21,723,037	\$19,865
East Aurora, Village of	\$502,971,670	\$18,201,854	\$16,645
Eden, Town of	\$508,946,069	\$3,034,861	\$2,775
Elma, Town of	\$963,282,441	\$32,043,064	\$29,302
Evans, Town of	\$685,741,543	\$32,013,430	\$29,275
Farnham, Village of	\$9,217,429	\$0	\$0
Gowanda, Village of	\$181,708,527	\$28,420,864	\$25,989
Grand Island, Town of	\$1,374,189,166	\$72,654,312	\$66,439
Hamburg, Town of	\$2,856,194,546	\$48,766,374	\$44,594
Hamburg, Village of	\$529,423,067	\$2,430,656	\$2,223
Holland, Town of	\$198,098,437	\$6,277,741	\$5,741
Kenmore, Village of	\$550,841,099	\$0	\$0
Lackawanna, City of	\$491,939,046	\$56,043,010	\$51,248
Lancaster, Town of	\$1,660,616,042	\$75,156,583	\$68,727
Lancaster, Village of	\$450,770,999	\$31,016,839	\$28,363
Marilla, Town of	\$311,750,105	\$10,105,725	\$9,241
Newstead, Town of	\$275,239,544	\$11,293,093	\$10,327
North Collins, Town of	\$98,650,414	\$0	\$0
North Collins, Village of	\$37,193,882	\$0	\$0
Orchard Park, Town of	\$2,336,747,037	\$39,302,680	\$35,940
Orchard Park, Village of	\$236,476,957	\$6,677,999	\$6,107
Sardinia, Town of	\$170,717,652	\$4,458,357	\$4,077
Sloan, Village of	\$88,611,517	\$0	\$0
Springville, Village of	\$251,437,691	\$3,545,181	\$3,242

Table 3c.4
Estimated Annual Damages – Flood
(Source: NCDC/NFIP)

Jurisdiction	Total Value of Improvements	Total Value of Improvements in the 100yr Flood Hazard Area*	Average Annual Loss Estimates, Flood
Tonawanda, City of	\$554,230,484	\$3,815,944	\$3,489
Tonawanda Reservation	\$0	\$0	\$0
Tonawanda, Town of	\$3,937,280,456	\$106,813,153	\$97,675
Wales, Town of	\$184,172,577	\$5,205,808	\$4,760
West Seneca, Town of	\$2,487,639,045	\$147,649,344	\$135,018
Williamsville, Village of	\$313,425,118	\$18,898,475	\$17,282
Erie, County of	\$48,211,433,723	\$1,831,706,524	\$1,675,000

*Zones A, AE, only

Ice Jams

Impacts – Ice Jams

Flooding caused by ice jams is similar to flash flooding. Ice jam formation causes a rapid rise of water at the jam and extending upstream. Failure or release of the jam causes sudden flooding downstream. The suddenness of a jam's formation and release can cause more widespread and more significant impacts. So, too, can the degree of impacts be increased for longer duration events. The impacts of ice jam related flooding are the same as other types of flood impacts; see previous description on Page 3c-7.

Estimated Damages – Ice Jams

It is difficult to identify particular areas that are generally prone to ice jam flooding because the hazard can be very localized. The formation of ice jams depends on the weather and physical conditions in river channels. Unlike the typical violent flash flooding occurrences where steep terrain is present, ice jams are most likely to occur where the channel slope naturally decreases, where culverts freeze solid at headwaters of reservoirs, at natural channel restrictions such as bends and bridges, and along shallows where channels may freeze solid. The ice jam hazard and associated damages are assumed to be possible in 14 of Erie County's 44 municipalities where past occurrences are documented, based on a review of historical records in the USACE CRREL database of events. The CRREL database notes 118 events for the 82 year period of record between 1929 and 2011. Prior to 1955, event records are limited to general notes regarding discharges and gage heights. Beginning in 1955, record details begin to include qualitative assessments of impacts including overbank flooding, road closures, evacuations, etc. Dollar damages are listed as unknown for most of the event records, with the exception of nine events. Damages from these events alone total \$1,009,500 (or average damages per event of \$112,167).

Due to the nature of the terrain and the climate in Erie County, ice jam events are essentially certain to occur in the future, although whether or not such events will cause significant damage is less easy to predict, since detailed records of actual damage caused by ice jams are scarce. The available data also does not easily allow for a meaningful average number of occurrences per year to be computed, since the actual number of recorded incidents is quite low and information on historic damages incurred per event was unavailable. For damage estimation purposes, it was assumed that if historic damages for noted occurrences was significant, more detailed information would have been uncovered during the research phase of this project. Lack of quantifiable damages was deemed to imply a likelihood of negligible average annual damages for the susceptible municipalities (where negligible has been defined as less than \$5,000 per year). This assumption should be revisited in future updates of the plan if better data should become available.

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Damage from ice jam flooding usually exceeds that caused by open water flooding. Flood elevations are usually higher than predicted for free-flow conditions and water levels may change rapidly. Additional physical damage is caused by the force of ice impacting buildings and other structures. Because of the sometimes unpredictable nature of ice jam floods, FEMA's Flood Insurance Rate Maps often do not reflect ice jam flood threats.

Loss estimation methodologies are not currently available for estimating ice jam damages. Sufficient historical data regarding events and associated losses was not available to quantify here. For the purpose of this analysis, some assumptions have been made for planning purposes. First, CRREL reports 118 events over an 82 year period, or an average of 1.44 events per year. Damages are only quantified for nine of the 118 events, for a total of \$1,009,500 and average damages per event of \$112,167. Multiplying the average number of events per year of 1.44 by the average damages per event of \$112,167 yields average annual damages of \$161,410, county-wide. This is presumed to be a low estimate, not representative of all damages incurred for the reported events, and not taking into account the time value of money since the date of the event record. Due to the limitations of the data, meaningful estimates of average annual damages are not quantifiable for the impacted communities. However, distributing this countywide average annual damages (\$161,410) over the 14 historically affected communities based on the total proportion of events occurring in that community, estimates have been made as whether or not average annual damages in each impacted community could be potentially significant (more than \$5,000). With this rudimentary methodology, estimated average annual damages for ice jams are presented in **Table 3c.5**. The margin of error is likely quite high, using this methodology and given the assumptions necessary and limitations of the dataset.

Table 3c.5
Estimated Annual Damages – Ice Jams
(Source: CRREL)

Jurisdiction	Number of Events in Community, As Reported By CRREL	Proportion of Events located in Community	Estimated Average Annual Damages *
Akron, Village of	0	0%	\$0
Alden, Town of	1	1%	U _N
Alden, Village of	0	0%	\$0
Amherst, Town of	0	0%	\$0
Angola, Village of	0	0%	\$0
Aurora, Town of	0	0%	\$0
Blasdell, Village of	0	0%	\$0
Boston, Town of	0	0%	\$0
Brant, Town of	0	0%	\$0
Buffalo, City of	13	11%	U_S
Cheektowaga, Town of	1	1%	U _N
Clarence, Town of	0	0%	\$0
Colden, Town of	0	0%	\$0
Collins, Town of	1	1%	U _N
Concord, Town of	0	0%	\$0
Depew, Village of	0	0%	\$0
East Aurora, Village of	5	4%	U_S
Eden, Town of	0	0%	\$0
Elma, Town of	2	2%	U _N
Evans, Town of	4	3%	U _N
Farnham, Village of	0	0%	\$0
Gowanda, Village of	9	8%	U_S
Grand Island, Town of	0	0%	\$0
Hamburg, Town of	0	0%	\$0
Hamburg, Village of	0	0%	\$0
Holland, Town of	0	0%	\$0
Kenmore, Village of	0	0%	\$0

Table 3c.5
Estimated Annual Damages – Ice Jams
(Source: CRREL)

Jurisdiction	Number of Events in Community, As Reported By CRREL	Proportion of Events located in Community	Estimated Average Annual Damages *
Lackawanna, City of	4	3%	U _N
Lancaster, Town of	0	0%	\$0
Lancaster, Village of	35	30%	U_S
Marilla, Town of	0	0%	\$0
Newstead, Town of	0	0%	\$0
North Collins, Town of	0	0%	\$0
North Collins, Village of	0	0%	\$0
Orchard Park, Town of	0	0%	\$0
Orchard Park, Village of	0	0%	\$0
Sardinia, Town of	0	0%	\$0
Sloan, Village of	0	0%	\$0
Springville, Village of	1	1%	U _N
Tonawanda, City of	6	5%	U_S
Tonawanda, Town of	0	0%	\$0
Wales, Town of	0	0%	\$0
West Seneca, Town of	35	30%	U_S
Williamsville, Village of	1	1%	U _N
Erie, County of	118	100%	U_S
* U _N = Unquantifiable, likely negligible (where ‘negligible’ is defined as <\$5,000 on an average annual basis) U _S = Unquantifiable, potentially significant (where ‘significant’ is defined as >\$5,000 on an average annual basis)			

Wave Action

Impacts – Wave Action

Wave action is a significant hazard to buildings and infrastructure located in coastal areas. Large, fast moving waves can cause extreme erosion and scour and their impact on buildings can cause severe damage to structures and their contents. Storm surge and wind increase the destructiveness of waves and cause them to reach higher elevations and penetrate further inland.

Estimated Damages – Wave Action

Sufficient data was not readily available at the time of the study to estimate in detail damages specifically due to wave action. Areas identified as Velocity Hazard Zones (V/VE Zones on Flood Insurance Rate Maps), in which computed wave heights for the base flood are considered ‘damaging’ (three feet or more), are not mapped on the FEMA DFIRMS. Thus, a specific, delineable wave action hazard area for Lake Erie coastal communities is undefined. Furthermore, NCDC damage reports for storm events with which aggressive wave action is usually associated do not provide enough detail to isolate direct wave action damages from the overall event damage totals, and development of meaningful event damages from scratch would require detailed structure inventory data not readily available and sophisticated computer modeling applications usually deemed beyond the scope of the typical hazard mitigation planning process. Hence although there is the possibility that occasional individual events (such as those associated with severe summer/winter storms or seiches) may result in significant losses due to wave action, annualized losses due to wave action are currently unquantifiable for the coastal communities (the Cities of Buffalo and Lackawanna, and the Towns of Hamburg, Evans and Brant).

Geologic Hazards

Earthquakes

Impacts – Earthquakes

Most earthquake-related property damage and deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the extent and duration of the shaking. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (in mountain regions and along hillsides), and liquefaction.

Exposure – Earthquakes

Table 3c.6 presents the areas of earthquake hazard risk in each municipality by the adjusted spectral acceleration (SA) with a 2% probability of occurrence in 50 years. **Table 3c.7** presents the values of improved property within those hazard areas for each municipality. For clarity and conciseness Tables 3c.6 and 3c.7 have omitted the acreages and improved values in areas of the two lowest risk hazard bands included in Figure 3a.22 (with SA values less than 35).

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**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

Table 3c.6
Erie County Earthquake Hazard: Adjusted USGS 0.2 Sec Spectral Acceleration
With a 2% Probability of Exceedance over 50 Years - Acreages
(Source: NYSEMO/NYS Geological Survey)

Municipality	Total Acres	SA (%g) 35-45		SA (%g) 45-55		SA (%g) 55-65		SA (%g) 65-75	
		Acres	%	Acres	%	Acres	%	Acres	%
Akron, Village of	1,228.0	0.0	0.0%	0.0	0.0%	0.0	0.0%	2.4	0.2%
Alden, Town of	20,394.4	8,801.5	43.2%	177.7	0.9%	0.0	0.0%	7,237.4	35.5%
Alden, Village of	1,711.5	1,686.5	98.5%	0.0	0.0%	0.0	0.0%	25.0	1.5%
Amherst, Town of	33,488.6	1,118.7	3.3%	1,233.8	3.7%	0.0	0.0%	19,645.8	58.7%
Angola, Village of	869.6	0.0	0.0%	0.0	0.0%	392.2	45.1%	477.4	54.9%
Aurora, Town of	21,739.4	2,516.7	11.6%	2,320.5	10.7%	0.0	0.0%	2,753.8	12.7%
Blasdell, Village of	635.6	0.0	0.0%	0.0	0.0%	0.0	0.0%	635.6	100.0%
Boston, Town of	22,926.1	408.6	1.8%	0.0	0.0%	0.0	0.0%	2,951.9	12.9%
Brant, Town of	14,900.8	947.2	6.4%	0.0	0.0%	11,585.6	77.8%	136.6	0.9%
Buffalo, City of	26,275.3	1,993.5	7.6%	464.1	1.8%	0.0	0.0%	23,451.1	89.3%
Cattaraugus Reservation	16,458.1	2,470.5	15.0%	0.0	0.0%	12,183.2	74.0%	0.0	0.0%
Cheektowaga, Town of	16,292.4	2,388.5	14.7%	786.1	4.8%	0.0	0.0%	10,859.5	66.7%
Clarence, Town of	34,321.3	3,146.4	9.2%	5,273.5	15.4%	0.0	0.0%	12,938.3	37.7%
Colden, Town of	22,830.7	626.5	2.7%	29.9	0.1%	0.0	0.0%	931.8	4.1%
Collins, Town of	30,405.8	1,037.9	3.4%	0.0	0.0%	3,570.3	11.7%	0.0	0.0%
Concord, Town of	42,641.2	13,579.5	31.8%	0.0	0.0%	1,188.7	2.8%	157.4	0.4%
Depew, Village of	3,228.1	512.4	15.9%	77.0	2.4%	0.0	0.0%	2,638.7	81.7%
East Aurora, Village of	1,590.2	373.6	23.5%	921.8	58.0%	0.0	0.0%	228.7	14.4%
Eden, Town of	25,517.9	3,123.1	12.2%	0.0	0.0%	0.0	0.0%	3,436.5	13.5%
Elma, Town of	22,116.0	7,444.5	33.7%	909.7	4.1%	0.0	0.0%	8,073.8	36.5%
Evans, Town of	25,727.4	1,066.5	4.1%	0.0	0.0%	6,077.9	23.6%	17,013.9	66.1%
Farnham, Village of	652.0	0.0	0.0%	0.0	0.0%	589.5	90.4%	0.0	0.0%
Gowanda, Village of	359.8	0.0	0.0%	0.0	0.0%	359.8	100.0%	0.0	0.0%
Grand Island, Town of	18,180.7	2,993.7	16.5%	0.0	0.0%	0.0	0.0%	3,209.2	17.7%
Hamburg, Town of	24,224.8	52.9	0.2%	0.0	0.0%	0.0	0.0%	16,880.7	69.7%
Hamburg, Village of	1,523.6	0.0	0.0%	0.0	0.0%	0.0	0.0%	548.2	36.0%

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

Table 3c.6
Erie County Earthquake Hazard: Adjusted USGS 0.2 Sec Spectral Acceleration
With a 2% Probability of Exceedance over 50 Years - Acreages
(Source: NYSEMO/NYS Geological Survey)

Municipality	Total Acres	SA (%g) 35-45		SA (%g) 45-55		SA (%g) 55-65		SA (%g) 65-75	
		Acres	%	Acres	%	Acres	%	Acres	%
Holland, Town of	22,874.0	0.0	0.0%	0.0	0.0%	0.0	0.0%	580.5	2.5%
Kenmore, Village of	916.0	0.0	0.0%	0.0	0.0%	0.0	0.0%	915.9	100.0%
Lackawanna, City of	4,231.7	545.3	12.9%	0.0	0.0%	0.0	0.0%	3,575.3	84.5%
Lancaster, Town of	21,394.0	2,916.3	13.6%	2,836.7	13.3%	0.0	0.0%	12,685.1	59.3%
Lancaster, Village of	1,758.9	220.8	12.6%	0.0	0.0%	0.0	0.0%	1,538.1	87.4%
Marilla, Town of	17,546.4	6,179.9	35.2%	4,001.5	22.8%	0.0	0.0%	1,025.1	5.8%
Newstead, Town of	31,404.9	3,452.9	11.0%	5,750.5	18.3%	0.0	0.0%	9,287.3	29.6%
North Collins, Town of	27,008.7	891.2	3.3%	0.0	0.0%	1,557.7	5.8%	31.7	0.1%
North Collins, Village of	501.9	501.5	99.9%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Orchard Park, Town of	23,807.9	5,642.2	23.7%	363.4	1.5%	0.0	0.0%	1,361.9	5.7%
Orchard Park, Village of	863.2	862.1	99.9%	1.1	0.1%	0.0	0.0%	0.0	0.0%
Sardinia, Town of	32,214.5	8,327.9	25.9%	0.0	0.0%	349.0	1.1%	363.9	1.1%
Sloan, Village of	502.5	0.0	0.0%	0.0	0.0%	0.0	0.0%	502.5	100.0%
Springville, Village of	2,325.0	2,201.6	94.7%	0.0	0.0%	0.3	0.0%	0.0	0.0%
Tonawanda, City of	2,378.7	864.2	36.3%	0.0	0.0%	0.0	0.0%	768.2	32.3%
Tonawanda Reservation	1,158.1	0.0	0.0%	779.7	67.3%	0.0	0.0%	378.4	32.7%
Tonawanda, Town of	11,172.5	667.7	6.0%	0.0	0.0%	0.0	0.0%	8,866.5	79.4%
Wales, Town of	22,860.9	1,205.7	5.3%	677.7	3.0%	0.0	0.0%	3,577.8	15.7%
West Seneca, Town of	13,742.5	1,218.9	8.9%	0.0	0.0%	0.0	0.0%	10,054.1	73.2%
Williamsville, Village of	768.1	0.0	0.0%	0.0	0.0%	0.0	0.0%	10.2	1.3%
Erie County Total	669,669.3	91,986.5	13.7%	26,605.0	4.0%	37,854.3	5.7%	189,756.3	28.3%

Low risk SA categories (<25 and 25 – 35) omitted for clarity

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

Table 3c.7
Erie County Earthquake Hazard: Adjusted USGS 0.2 Sec Spectral Acceleration
With a 2% Probability of Exceedance over 50 Years – Improved Property
(Source: NYSEMO/NYS Geological Survey)

Municipality	Total Improved Property	SA (%g) 35-45		SA (%g) 45-55		SA (%g) 55-65		SA (%g) 65-75	
		Improved Property	%	Improved Property	%	Improved Property	%	Improved Property	%
Akron, Village of	\$147,386,383	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$429,514	0.3%
Alden, Town of	\$596,764,911	\$153,017,409	25.6%	\$195,511	0.0%	\$0	0.0%	\$240,299,697	40.3%
Alden, Village of	\$113,968,804	\$113,935,157	100.0%	\$0	0.0%	\$0	0.0%	\$33,647	0.0%
Amherst, Town of	\$8,287,199,614	\$796,886,010	9.6%	\$305,145,448	3.7%	\$0	0.0%	\$3,283,696,695	39.6%
Angola, Village of	\$70,253,637	\$0	0.0%	\$0	0.0%	\$23,679,961	33.7%	\$46,573,312	66.3%
Aurora, Town of	\$732,629,812	\$161,425,223	22.0%	\$89,271,117	12.2%	\$0	0.0%	\$110,147,642	15.0%
Blasdell, Village of	\$105,746,861	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$105,747,574	100.0%
Boston, Town of	\$395,564,101	\$1,269,303	0.3%	\$0	0.0%	\$0	0.0%	\$135,707,399	34.3%
Brant, Town of	\$80,726,326	\$4,239,141	5.3%	\$0	0.0%	\$62,256,451	77.1%	\$312,827	0.4%
Buffalo, City of	\$7,836,060,944	\$778,034,198	9.9%	\$687,003,104	8.8%	\$0	0.0%	\$6,336,479,024	80.9%
Cattaraugus Reservation	\$0	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Cheektowaga, Town of	\$3,843,969,994	\$570,889,440	14.9%	\$65,928,289	1.7%	\$0	0.0%	\$2,573,782,902	67.0%
Clarence, Town of	\$2,451,434,606	\$394,403,567	16.1%	\$608,686,702	24.8%	\$0	0.0%	\$165,059,334	6.7%
Colden, Town of	\$210,932,688	\$13,206,240	6.3%	\$215,000	0.1%	\$0	0.0%	\$20,942,861	9.9%
Collins, Town of	\$140,401,209	\$10,970,992	7.8%	\$0	0.0%	\$55,866,225	39.8%	\$0	0.0%
Concord, Town of	\$266,337,175	\$75,484,904	28.3%	\$0	0.0%	\$2,363,051	0.9%	\$2,371,835	0.9%
Depew, Village of	\$687,275,077	\$48,554,160	7.1%	\$9,451,482	1.4%	\$0	0.0%	\$629,269,159	91.6%
East Aurora, Village of	\$502,982,763	\$97,647,079	19.4%	\$356,235,000	70.8%	\$0	0.0%	\$39,010,070	7.8%
Eden, Town of	\$508,945,663	\$41,338,777	8.1%	\$0	0.0%	\$0	0.0%	\$32,838,961	6.5%
Elma, Town of	\$963,279,568	\$360,311,622	37.4%	\$31,841,139	3.3%	\$0	0.0%	\$343,707,354	35.7%
Evans, Town of	\$688,158,533	\$17,216,927	2.5%	\$0	0.0%	\$173,106,196	25.2%	\$439,820,883	63.9%
Farnham, Village of	\$9,217,429	\$0	0.0%	\$0	0.0%	\$8,135,999	88.3%	\$0	0.0%
Gowanda, Village of	\$181,711,307	\$0	0.0%	\$0	0.0%	\$181,711,307	100.0%	\$0	0.0%
Grand Island, Town of	\$1,374,192,506	\$232,526,856	16.9%	\$0	0.0%	\$0	0.0%	\$253,641,148	18.5%
Hamburg, Town of	\$2,856,457,549	\$4,557,152	0.2%	\$0	0.0%	\$0	0.0%	\$1,973,116,512	69.1%
Hamburg, Village of	\$529,422,415	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$199,453,239	37.7%
Holland, Town of	\$198,103,906	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$10,156,649	5.1%

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

Table 3c.7
Erie County Earthquake Hazard: Adjusted USGS 0.2 Sec Spectral Acceleration
With a 2% Probability of Exceedance over 50 Years – Improved Property
(Source: NYSEMO/NYS Geological Survey)

Municipality	Total Improved Property	SA (%g) 35-45		SA (%g) 45-55		SA (%g) 55-65		SA (%g) 65-75	
		Improved Property	%	Improved Property	%	Improved Property	%	Improved Property	%
Kenmore, Village of	\$550,842,370	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$550,841,099	100.0%
Lackawanna, City of	\$491,989,230	\$119,636,430	24.3%	\$0	0.0%	\$0	0.0%	\$372,166,568	75.6%
Lancaster, Town of	\$1,660,594,610	\$338,991,799	20.4%	\$111,733,698	6.7%	\$0	0.0%	\$1,061,760,795	63.9%
Lancaster, Village of	\$450,761,881	\$31,507,452	7.0%	\$0	0.0%	\$0	0.0%	\$419,255,598	93.0%
Marilla, Town of	\$311,762,654	\$113,621,337	36.4%	\$109,871,812	35.2%	\$0	0.0%	\$15,686,984	5.0%
Newstead, Town of	\$275,242,465	\$31,923,322	11.6%	\$44,029,312	16.0%	\$0	0.0%	\$54,710,766	19.9%
North Collins, Town of	\$98,650,414	\$8,266,370	8.4%	\$0	0.0%	\$10,016,144	10.2%	\$437,226	0.4%
North Collins, Village of	\$37,194,174	\$37,193,076	100.0%	\$0	0.0%	\$0	0.0%	\$806	0.0%
Orchard Park, Town of	\$2,336,738,931	\$546,473,550	23.4%	\$40,812,510	1.7%	\$0	0.0%	\$61,522,102	2.6%
Orchard Park, Village of	\$236,478,010	\$236,478,010	100.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Sardinia, Town of	\$171,167,007	\$72,656,923	42.4%	\$0	0.0%	\$1,275,504	0.7%	\$2,361,806	1.4%
Sloan, Village of	\$88,611,517	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$88,611,517	100.0%
Springville, Village of	\$251,444,560	\$242,477,971	96.4%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Tonawanda, City of	\$554,227,967	\$221,430,256	40.0%	\$0	0.0%	\$0	0.0%	\$128,853,383	23.2%
Tonawanda Reservation	\$0	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$0	0.0%
Tonawanda, Town of	\$3,937,290,613	\$160,450,081	4.1%	\$0	0.0%	\$0	0.0%	\$3,069,417,143	78.0%
Wales, Town of	\$184,189,527	\$7,799,759	4.2%	\$16,850,256	9.1%	\$0	0.0%	\$40,161,478	21.8%
West Seneca, Town of	\$2,487,649,101	\$267,934,570	10.8%	\$0	0.0%	\$0	0.0%	\$1,624,554,037	65.3%
Williamsville, Village of	\$313,415,097	\$0	0.0%	\$0	0.0%	\$0	0.0%	\$1,392,947	0.4%
Erie County Total	\$48,217,373,909	\$6,312,755,063	13.1%	\$2,477,270,381	5.1%	\$518,410,837	1.1%	\$24,434,332,493	50.7%

Low risk SA categories (<25 and 25 – 35) omitted for clarity

Estimated Damages – Earthquakes

As stated previously in the plan in the Hazard Profile section, according to the Earthquake Hazard Map of New York State, there is a 10 percent chance over 50 years that an earthquake with a PGA of greater than 3 to 4%g will be centered within Erie County. This earthquake, if it were to occur, would likely have associated with it light to moderate perceived shaking and little to no damage. PGA's of between 8 and 10%g would most often be required to cause appreciable damage, say, to unreinforced masonry buildings. While it is true that earthquakes are possible in this part of New York, they are not particularly likely, or likely to be particularly intense. Therefore, a full earthquake loss estimation was not conducted at this time for individual jurisdictions. However, countywide data included in the State Plan has been evaluated and is presented later in this section.

Examples of the types of damages that could be observed during an earthquake with a PGA of 3 to 5%g include:

- ⇒ Felt indoors by many, outdoors by few during the day
- ⇒ At night, some awakened.
- ⇒ Dishes, windows, doors disturbed and possibly broken
- ⇒ Walls make cracking sounds
- ⇒ Unstable objects could be overturned
- ⇒ Sensation like heavy truck striking building
- ⇒ Standing automobiles rocked noticeably

For earthquakes, the hazard area encompasses the entire study area and therefore all assets could be impacted.

FEMA's How-To #2 suggests that for earthquake loss estimation, data regarding building type, type of foundation, building code design level, and date of construction, is required for a quality analysis. This is because certain structures are more susceptible to earthquake damage than others. In the State of New York, regulations accounting for earthquake risk exist for new construction. Older buildings, built before these standard building codes went into effect, are more susceptible to earthquake damage. Similarly, unreinforced masonry buildings are more likely to sustain earthquake damage. While extensive damage to even these structures is unlikely, based on the mapped hazard areas, identifying this subset of buildings is important, particularly with regard to critical facilities that may meet these criteria. This information was not readily available at the time of the study for the planning area.

The New York State Hazard Mitigation Plan includes HAZUS-MH runs for earthquake losses in counties across New York State. The data prepared by the State estimates the following potential earthquake losses for Erie County as shown in **Table 3c.8**. This includes; Total Exposure – representing dollar value of all general building stock and calculated potential total losses (Capital Stock + Income Losses) for the four return periods of 2500, 1000, 500, & 250-years.

Table 3c.8	
Total Earthquake Losses – Erie County	
For the Four Return Periods of 2500, 1000, 500 and 250 years	
<i>(Source: New York State Hazard Mitigation Plan)</i>	
Return Period (Years)	Total Losses
2,500	\$2,650,440
1,000	\$670,569
500	\$164,041
250	\$39,215

SECTION 3C – RISK ASSESSMENT: DAMAGE ESTIMATES

The State Plan goes on to show (in Figure 3-196) estimated annualized total earthquake losses for Erie County (factoring in NEHRP soil classifications) of \$872,128. The total figure ranks Erie County 9th for annualized earthquake losses among all of New York State's 62 counties. For comparison purposes, the highest annualized losses were calculated in New York County (\$3,798,860) and the lowest were calculated in Yates County at (\$4,215).

For the purposes of estimating annual earthquake damages in more detail, the estimated annual earthquake losses from the State Plan to structures for the County (\$872,128) have been distributed among the municipalities according to their estimated total value of improvements and the results presented in **Table 3c.9**. These estimates assume a consistent level of seismic risk across the whole County and, while the overall county-wide estimate does factor in NEHRP soil classifications, distribution of this total across the individual municipalities does not address variations in damages due to soil type between municipalities.

Jurisdiction	Total Value of Improvements	Annual Loss Estimate, Earthquakes
Akron, Village of	\$147,386,383	\$2,666
Alden, Town of	\$596,764,911	\$10,794
Alden, Village of	\$113,968,804	\$2,061
Amherst, Town of	\$8,287,199,614	\$149,894
Angola, Village of	\$70,253,637	\$1,271
Aurora, Town of	\$732,629,812	\$13,251
Blasdell, Village of	\$105,746,861	\$1,913
Boston, Town of	\$395,564,101	\$7,155
Brant, Town of	\$80,726,326	\$1,460
Buffalo, City of	\$7,836,060,944	\$141,734
Cattaraugus Reservation	\$0	\$0
Cheektowaga, Town of	\$3,843,969,994	\$69,528
Clarence, Town of	\$2,451,434,606	\$44,340
Colden, Town of	\$210,932,688	\$3,815
Collins, Town of	\$140,401,209	\$2,539
Concord, Town of	\$266,337,175	\$4,817
Depew, Village of	\$687,275,077	\$12,431
East Aurora, Village of	\$502,982,763	\$9,098
Eden, Town of	\$508,945,663	\$9,206
Elma, Town of	\$963,279,568	\$17,423
Evans, Town of	\$688,158,533	\$12,447
Farnham, Village of	\$9,217,429	\$167
Gowanda, Village of	\$181,711,307	\$3,287
Grand Island, Town of	\$1,374,192,506	\$24,856
Hamburg, Town of	\$2,856,457,549	\$51,666
Hamburg, Village of	\$529,422,415	\$9,576
Holland, Town of	\$198,103,906	\$3,583
Kenmore, Village of	\$550,842,370	\$9,963
Lackawanna, City of	\$491,989,230	\$8,899
Lancaster, Town of	\$1,660,594,610	\$30,036
Lancaster, Village of	\$450,761,881	\$8,153
Marilla, Town of	\$311,762,654	\$5,639
Newstead, Town of	\$275,242,465	\$4,978
North Collins, Town of	\$98,650,414	\$1,784
North Collins, Village of	\$37,194,174	\$673
Orchard Park, Town of	\$2,336,738,931	\$42,266
Orchard Park, Village of	\$236,478,010	\$4,277

SECTION 3C – RISK ASSESSMENT: DAMAGE ESTIMATES

Table 3c.9 Estimated Annual Average Damages – Earthquake		
Jurisdiction	Total Value of Improvements	Annual Loss Estimate, Earthquakes
Sardinia, Town of	\$171,167,007	\$3,096
Sloan, Village of	\$88,611,517	\$1,603
Springville, Village of	\$251,444,560	\$4,548
Tonawanda, City of	\$554,227,967	\$10,025
Tonawanda Reservation	\$0	\$0
Tonawanda, Town of	\$3,937,290,613	\$71,215
Wales, Town of	\$184,189,527	\$3,332
West Seneca, Town of	\$2,487,649,101	\$44,995
Williamsville, Village of	\$313,415,097	\$5,669
<i>Erie, County of</i>	\$48,217,373,909	\$872,128

Expansive Soils

Impacts – Expansive Soils

Expansive soils can cause damage to houses, other buildings, roads, pipelines, roads, bridges, railways, supply lines, and other structures built upon them. Expansive soils do not change size quickly, and they impacts they cause often build up slowly over a matter of months or years.

Exposure and Estimated Damages – Expansive Soils

At this time, damages associated with expansive soils have been estimated based upon historic event information. Records of damages associated with expansive soils are only available for the Town of Amherst. Here, the Town's records (as reported in the USACE's "Town of Amherst Soils and Residential Foundation Study") indicate average total repair costs of \$7,900 on 1,095 structures (a total of about \$8,650,500) over an 18 year period of record from 1987 to 2005. This is equivalent to an average annual damage of \$480,583 in the Town.

Other municipalities are presumed to have average annual damages of an unquantifiable amount, assumed to be negligible based on best readily available information at this time.

It should be noted that the estimate of average annual damage associated strictly with expansive soils could be high, as the USACE report notes other potential causative factors for the types of damages observed. However, it represents the best available data at the time of this report. If better data becomes available in the future, this section should be revised for future plan updated.

The USACE's report recommended two main actions for mitigating this hazard – in short, code modifications and public education. Both of these measures have been implemented. The Town of Amherst has, therefore, not included separate expansive soils mitigation actions in its municipal Mitigation Strategy at this time. The updated building codes now ensure adequate protection for new construction, as well as repairs to damaged facilities. While continued damages may be incurred for some time (the USACE report estimates that the number of repair permits may increase from 1,095 over time and may approach 2,000), mitigation will lie in implementation of the new building code to adequately protect new construction and structures that will need to be repaired.

Landslides

Impacts – Landslides

The impacts of a landslide depend in large part on the degree of development in the area in which it occurs and the geographic area of slide itself. Potential impacts of landslides include environmental disturbance, property and infrastructure damage, and injuries or fatalities. Landslide impacts are typically limited to those areas immediately surrounding the slope failure. The structural integrity of buildings in the affected area can be compromised, or the entire building can be destroyed. Roadways and drainage systems in affected areas can be damaged or destroyed as well. Because landslides happen without warning, loss of life and injuries in affected areas are also possible.

Exposure and Estimated Damages – Landslides

The GIS data used to generate Figure 3a.28 was used to estimate the extent of land areas vulnerable to landslides and the value of improved property within those areas in each municipality, as presented in **Table 3c.10**. It should be noted that this mapping represents the overall risk of landslides, and occasional areas more vulnerable to landslides may exist within low risk or incidence areas due to local topographical conditions.

A more detailed breakdown of property exposed to the mapped landslide hazard by land use types is presented in Appendix A.

The Erie County HAZNY notes that landslides occur with no warning of onset, and have a typical duration of about one day

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.10
Landslide Risk by Municipality**

Municipality	Total Area (Acres)	Total Improved Value	Moderate Incidence				Moderate Susceptibility/Low Incidence			
			Area (Acres)	%	Improved Value	%	Area (Acres)	%	Improved Value	%
Akron, Village of	1,228.0	\$147,386,383	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Alden, Town of	20,394.4	\$596,764,911	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Alden, Village of	1,711.5	\$113,968,804	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Amherst, Town of	33,488.6	\$8,287,199,614	0.0	0%	\$0	0.0%	33,488.6	100.0%	\$8,287,199,733	100.0%
Angola, Village of	869.6	\$70,253,637	322.3	37.1%	\$43,385,278	61.8%	0.0	0.0%	\$0	0.0%
Aurora, Town of	21,739.4	\$732,629,812	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Blasdell, Village of	635.6	\$105,746,861	0.0	0%	\$0	0.0%	635.6	100.0%	\$105,747,574	100.0%
Boston, Town of	22,926.1	\$395,564,101	0.0	0%	\$0	0.0%	0.2	0.0%	\$19,820	0.0%
Brant, Town of	14,900.8	\$80,726,326	3,916.2	26.3%	\$38,252,929	47.4%	0.0	0.0%	\$0	0.0%
Buffalo, City of	26,275.3	\$7,836,060,944	0.0	0%	\$0	0.0%	25,692.2	97.8%	\$7,756,764,627	99.0%
Cattaraugus Reservation	16,458.1	\$0	3,139.5	19.1%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Cheektowaga, Town of	16,292.4	\$3,843,969,994	0.0	0%	\$0	0.0%	16,292.4	100.0%	\$3,843,967,214	100.0%
Clarence, Town of	34,321.3	\$2,451,434,606	0.0	0%	\$0	0.0%	30,734.6	89.5%	\$2,242,006,040	91.5%
Colden, Town of	22,830.7	\$210,932,688	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Collins, Town of	30,405.8	\$140,401,209	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Concord, Town of	42,641.2	\$266,337,175	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Depew, Village of	3,228.1	\$687,275,077	0.0	0%	\$0	0.0%	3,228.1	100.0%	\$687,272,751	100.0%
East Aurora, Village of	1,590.2	\$502,982,763	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Eden, Town of	25,517.9	\$508,945,663	0.0	0%	\$0	0.0%	3,297.0	12.9%	\$55,794,658	11.0%
Elma, Town of	22,116.0	\$963,279,568	0.0	0%	\$0	0.0%	335.7	1.5%	\$23,423,606	2.4%
Evans, Town of	25,727.4	\$688,158,533	11,417.2	44.4%	\$577,277,692	84.0%	0.0	0.0%	\$0	0.0%
Farnham, Village of	652.0	\$9,217,429	652.0	100.0%	\$9,217,429	100.0%	0.0	0.0%	\$0	0.0%
Gowanda, Village of	359.8	\$181,711,307	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Grand Island, Town of	18,180.7	\$1,374,192,506	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Hamburg, Town of	24,224.8	\$2,856,457,549	1,480.9	6%	\$157,260,569	5.5%	18,866.9	77.9%	\$2,364,455,725	82.8%
Hamburg, Village of	1,523.6	\$529,422,415	0.0	0%	\$0	0.0%	1,523.6	100.0%	\$529,422,118	100.0%
Holland, Town of	22,874.0	\$198,103,906	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Kenmore, Village of	916.0	\$550,842,370	0.0	0%	\$0	0.0%	916.0	100.0%	\$550,841,099	100.0%

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.10
Landslide Risk by Municipality**

Municipality	Total Area (Acres)	Total Improved Value	Moderate Incidence				Moderate Susceptibility/Low Incidence			
			Area (Acres)	%	Improved Value	%	Area (Acres)	%	Improved Value	%
Lackawanna, City of	4,231.7	\$491,989,230	0.0	0%	\$0	0.0%	3,760.8	88.9%	\$488,692,521	99.3%
Lancaster, Town of	21,394.0	\$1,660,594,610	0.0	0%	\$0	0.0%	5,034.1	23.5%	\$701,674,641	42.3%
Lancaster, Village of	1,758.9	\$450,761,881	0.0	0%	\$0	0.0%	812.2	46.2%	\$214,901,379	47.7%
Marilla, Town of	17,546.4	\$311,762,654	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Newstead, Town of	31,404.9	\$275,242,465	0.0	0%	\$0	0.0%	9,644.2	30.7%	\$64,634,689	23.5%
North Collins, Town of	27,008.7	\$98,650,414	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
North Collins, Village of	501.9	\$37,194,174	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Orchard Park, Town of	23,807.9	\$2,336,738,931	0.0	0%	\$0	0.0%	9,173.9	38.5%	\$1,307,666,364	56.0%
Orchard Park, Village of	863.2	\$236,478,010	0.0	0%	\$0	0.0%	316.4	36.7%	\$83,173,011	35.2%
Sardinia, Town of	32,214.5	\$171,167,007	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Sloan, Village of	502.5	\$88,611,517	0.0	0%	\$0	0.0%	502.5	100.0%	\$88,611,517	100.0%
Springville, Village of	2,325.0	\$251,444,560	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
Tonawanda, City of	2,378.7	\$554,227,967	0.0	0%	\$0	0.0%	2,378.2	100.0%	\$554,227,967	100.0%
Tonawanda Reservation	1,158.1	\$0	0.0	0%	\$0	0.0%	1,156.4	99.8%	\$0	0.0%
Tonawanda, Town of	11,172.5	\$3,937,290,613	0.0	0%	\$0	0.0%	11,151.9	99.8%	\$3,912,070,647	99.5%
Wales, Town of	22,860.9	\$184,189,527	0.0	0%	\$0	0.0%	0.0	0.0%	\$0	0.0%
West Seneca, Town of	13,742.5	\$2,487,649,101	0.0	0%	\$0	0.0%	13,161.1	95.8%	\$2,424,320,168	97.5%
Williamsville, Village of	768.1	\$313,415,097	0.0	0%	\$0	0.0%	768.1	100.0%	\$313,414,723	100.0%
Erie County Total	669,669.3	\$48,217,373,909	20,928.1	3.1%	\$825,393,897	1.7%	192,870.6	28.8%	\$36,600,302,592	75.9%

Estimated Damages – Landslides

This version of the Erie County plan does not include a description of potential dollar loss estimations by jurisdiction for the landslide hazard because of the absence of certain essential information. At this time, vulnerability is being expressed as the value of improvements in the current mapped landslide hazard area as presented in the “Hazard Profiles” section of this plan.

The New York State Geological Survey records eleven specific landslide events in the County. However, damages are only quantified for a single event (\$250,000). Furthermore, while detailed information is available for only 11 events, NYSGS mapping shows these 11 events as well as three large areas identified as regions where slumping and sliding are too numerous to map. While a fair amount of historical data exists, many event records lack either specific dates, or specific damages, making it impossible to make any reasonable assumptions to tally up and annualize damages by jurisdiction. While preliminary loss estimates could perhaps have been generated through various assumptions for unknowns (including: inventory estimates of the more vulnerable structures such as those near steep slopes, steep slopes prone to erosion or structures near previous landslide occurrence areas, as well as historical, or critical structures and the type of and dollar damage figures), the many generalizations and guess work would result in loss estimates with little accuracy and potentially misleading indications of a jurisdiction’s vulnerability and potential loss to the landslide hazard. The NYS Hazard Mitigation Plan notes certain actions that are planned at the state level to improve data availability for landslide hazard risk assessments. As this data becomes available, it will be evaluated and incorporated as applicable into future updates of this county plan.

Further, according to FEMA’s How-To #2, current loss estimation methodologies are not available for estimating landslide damages. While the guide indicates that structures within a landslide hazard area could be assumed to be “severely” damaged and those outside could be assumed to be “undamaged”, applying this methodology would not be appropriate for Erie County given the lack of historical data from which to derive the frequencies of landslide events necessary for the calculation of annual loss estimates. In addition, specific information would be required for buildings in order to employ these methodologies, such as type of construction, foundation type, and details on any existing protective features. This data was not available as a part of the County GIS during this study.

Having even the year built data for each structure, one would be able to highlight structures built before codes and standards (such as steep slope ordinances) were adopted to make buildings more resistant to landslide damage, thus being better candidates for mitigation. Without the year-built data, this cannot be done.

If this information should become available in the future, it could be incorporated into future updates of the plan. While one could make some blanket assumptions at this time to use various tools for loss estimation, this would likely yield erroneous data given the high degree of variation in type and density of development. Acting upon such rough estimates could result in an unwise use of limited resources.

In general terms, estimated damages due to a single landslide event could be severe in any one location, and are most likely in areas of highest risk (as described in Section 3a).

Given the available sufficient historical data on past landslide occurrences, it is assumed that while one major event may result in significant losses, annualizing structural losses over a long period of time would most likely yield a negligible annual loss estimate for Erie County. For all other municipalities in the County, the available record of historic occurrences seems to indicate greater susceptibility in some

SECTION 3C – RISK ASSESSMENT: DAMAGE ESTIMATES

areas, and therefore it is generally assumed that annualizing structural losses over a long period of time could yield significant annual loss estimates for the jurisdictions in mapped higher risk areas with records of historic occurrences. See **Table 3c.11**.

Jurisdiction	Total Value of Improvements	Annual Loss Estimate, Landslides*
Akron, Village of	\$147,386,383	U _N
Alden, Town of	\$596,764,911	U _N
Alden, Village of	\$113,968,804	U _N
Amherst, Town of	\$8,287,199,614	Us
Angola, Village of	\$70,253,637	U _N
Aurora, Town of	\$732,629,812	U _N
Blasdell, Village of	\$105,746,861	U _N
Boston, Town of	\$395,564,101	Us
Brant, Town of	\$80,726,326	U _N
Buffalo, City of	\$7,836,060,944	U _N
Cattaraugus Reservation	\$0	U _N
Cheektowaga, Town of	\$3,843,969,994	Us
Clarence, Town of	\$2,451,434,606	Us
Colden, Town of	\$210,932,688	U _N
Collins, Town of	\$140,401,209	Us
Concord, Town of	\$266,337,175	Us
Depew, Village of	\$687,275,077	U _N
East Aurora, Village of	\$502,982,763	U _N
Eden, Town of	\$508,945,663	U _N
Elma, Town of	\$963,279,568	U _N
Evans, Town of	\$688,158,533	U _N
Farnham, Village of	\$9,217,429	U _N
Gowanda, Village of	\$181,711,307	U _N
Grand Island, Town of	\$1,374,192,506	U _N
Hamburg, Town of	\$2,856,457,549	U _N
Hamburg, Village of	\$529,422,415	U _N
Holland, Town of	\$198,103,906	U _N
Kenmore, Village of	\$550,842,370	U _N
Lackawanna, City of	\$491,989,230	U _N
Lancaster, Town of	\$1,660,594,610	Us
Lancaster, Village of	\$450,761,881	U _N
Marilla, Town of	\$311,762,654	U _N
Newstead, Town of	\$275,242,465	Us
North Collins, Town of	\$98,650,414	U _N
North Collins, Village of	\$37,194,174	U _N
Orchard Park, Town of	\$2,336,738,931	U _N
Orchard Park, Village of	\$236,478,010	U _N
Sardinia, Town of	\$171,167,007	Us
Sloan, Village of	\$88,611,517	U _N
Springville, Village of	\$251,444,560	Us
Tonawanda, City of	\$554,227,967	U _N
Tonawanda Reservation	\$0	U _N
Tonawanda, Town of	\$3,937,290,613	U _N

SECTION 3C – RISK ASSESSMENT: DAMAGE ESTIMATES

Table 3c.11
Estimated Annual Average Damages – Landslides

Jurisdiction	Total Value of Improvements	Annual Loss Estimate, Landslides*
Wales, Town of	\$184,189,527	U _s
West Seneca, Town of	\$2,487,649,101	U _N
Williamsville, Village of	\$313,415,097	U _N
Erie, County of	\$48,217,373,909	U_N

* U_N: Annual losses currently unquantifiable but assumed to be negligible on an annual basis (less than \$5,000); individual event damages, however, could be significant.

U_s: Annual losses currently unquantifiable but assumed to be potentially significant on an annual basis (more than \$5,000); individual event damages, however, could be significant.

OTHER HAZARDS

Wildfires

Impacts – Wildfires

Wildfires have the potential to destroy large portions of a community. Firefighters are at risk during the time that they are trying to contain and control the blaze. Loss of life and injuries are possible for people living, working, or traveling through an impacted area. Beyond the loss of vegetation that wildfires leave in their wake, structures in the wildland/urban interface can be severely damaged or destroyed. Following a large wildfire, the possibility exists for significant increases in stormwater runoff and landslides which can lead to downstream flooding. Depending on the scale of the impacted area and the type and numbers of buildings and infrastructure impacted, secondary effects are possible on local economies and the social fabric of communities following the event. Many areas at risk from wildfires tend to be popular with hunters, hikers and campers. Several locally important transportation routes touch on or traverse potentially vulnerable areas, leaving them vulnerable to closure during forest fire due to smoke conditions. Important infrastructure and utility assets such as power lines also traverse areas vulnerable to wildfires. Areas where the magnitude and severity of the hazard are the greatest tend to exhibit the lowest population densities in the County; as a result, the exposure of people living and working in the highest hazard areas is often relatively low.

Exposure – Wildfires

The wildfire risk for the individual municipalities within Erie County has been quantified by measuring the length of the developed-wildland interface and the total value of improved property located in hazard areas within the county. The developed-wildland interface was estimated incorporating a 200 foot buffer extending from the urban/developed areas into the wildfire risk areas, to account for the likelihood that structures in the urban area are at risk of combustion before a wildfire reaches the exact interface..

Tables 3c.12 and 3c.13 present detailed exposure information showing the land area and value of improvements within each mapped risk area.

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

Table 3c.12							
Exposure to Wildfire Risk in Erie County – Land Area							
Municipality	Total Municipal Area (Acres)	High Wildfire Hazard Severity, Exacerbated by Development (Acres)	High Wildfire Hazard Severity (Acres)	Moderate Wildfire Hazard Severity, Exacerbated by Development (Acres)	Moderate Wildfire Hazard Severity (Acres)	Wildfire Risk Zone With Improved Property Present (Acres)	Wildfire Risk Zone Without Improved Property Present (Acres)
Akron, Village of	1,228.0	46.1	22.1	23.2	5.6	709.2	269.6
Alden, Town of	20,394.4	121.2	55.6	68.4	11.0	12,004.1	6,450.2
Alden, Village of	1,711.5	42.3	22.5	6.3	2.4	992.0	831.9
Amherst, Town of	33,488.6	474.5	438.8	47.0	53.9	5,880.1	7,423.6
Angola, Village of	869.6	29.8	20.5	6.4	2.0	250.9	484.3
Aurora, Town of	21,739.4	166.5	54.0	30.9	5.1	20,223.3	7,466.3
Blasdell, Village of	635.6	2.7	5.7	1.6	3.6	37.2	62.7
Boston, Town of	22,926.1	121.0	29.2	71.3	12.9	19,525.3	9,992.0
Brant, Town of	14,900.8	56.8	32.6	8.8	1.1	7,445.9	6,912.7
Buffalo, City of	26,275.3	13.7	31.6	17.1	33.5	512.6	592.2
Cattaraugus Reservation	16,458.1	52.8	108.7	4.3	11.4	12,026.4	10,797.2
Cheektowaga, Town of	16,292.4	235.1	208.3	57.0	35.5	2,803.0	1,448.5
Clarence, Town of	34,321.3	347.8	183.7	73.0	29.5	14,098.7	8,854.5
Colden, Town of	22,830.7	38.4	23.6	7.1	4.0	21,668.6	10,250.1
Collins, Town of	30,405.8	98.7	60.5	21.6	7.3	20,602.3	18,310.9
Concord, Town of	42,641.2	54.0	37.9	4.7	4.4	37,207.4	20,221.7
Depew, Village of	3,228.1	22.1	58.9	7.8	12.3	285.9	447.9
East Aurora, Village of	1,590.2	49.2	32.0	3.8	4.7	789.2	356.6
Eden, Town of	25,517.9	92.6	47.4	23.6	5.7	19,184.6	7,237.6
Elma, Town of	22,116.0	297.9	91.6	72.3	11.4	17,883.4	7,210.7
Evans, Town of	25,727.4	320.2	351.6	57.6	32.2	15,900.9	12,439.0
Farnham, Village of	652.0	10.3	6.4	4.8	0.5	526.9	190.6
Gowanda, Village of	359.8	33.9	7.7	0.4	0.0	211.4	172.9
Grand Island, Town of	18,180.7	396.9	333.2	60.4	24.4	9,063.2	6,487.7
Hamburg, Town of	24,224.8	647.5	691.1	152.9	72.4	10,738.5	8,099.6
Hamburg, Village of	1,523.6	20.1	12.2	4.6	4.2	221.4	168.6
Holland, Town of	22,874.0	77.7	29.1	34.1	8.5	21,061.6	10,422.9
Kenmore, Village of	916.0	0.0	0.0	0.0	0.0	0.0	0.0
Lackawanna,	4,231.7	52.5	50.2	10.2	5.5	515.3	406.4

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

Table 3c.12							
Exposure to Wildfire Risk in Erie County – Land Area							
Municipality	Total Municipal Area (Acres)	High Wildfire Hazard Severity, Exacerbated by Development (Acres)	High Wildfire Hazard Severity (Acres)	Moderate Wildfire Hazard Severity, Exacerbated by Development (Acres)	Moderate Wildfire Hazard Severity (Acres)	Wildfire Risk Zone With Improved Property Present (Acres)	Wildfire Risk Zone Without Improved Property Present (Acres)
City of							
Lancaster, Town of	21,394.0	246.3	264.2	81.1	72.8	8,692.3	7,544.8
Lancaster, Village of	1,758.9	11.2	30.8	1.5	19.8	109.2	345.4
Marilla, Town of	17,546.4	63.2	14.2	24.4	2.7	11,441.3	4,936.9
Newstead, Town of	31,404.9	104.8	96.0	12.3	7.4	10,783.5	7,006.6
North Collins, Town of	27,008.7	20.4	11.5	6.8	2.4	16,735.7	11,157.5
North Collins, Village of	501.9	15.5	6.7	0.8	0.2	158.7	88.7
Orchard Park, Town of	23,807.9	518.5	318.6	122.1	47.4	17,379.6	8,013.3
Orchard Park, Village of	863.2	38.4	9.0	6.0	1.7	696.3	92.9
Sardinia, Town of	32,214.5	61.1	28.9	13.5	2.9	25,861.5	13,859.3
Sloan, Village of	502.5	0.0	0.0	0.0	0.0	0.0	0.0
Springville, Village of	2,325.0	56.8	15.8	6.2	2.9	863.0	554.1
Tonawanda, City of	2,378.7	6.2	11.9	4.9	0.6	97.6	73.0
Tonawanda Reservation	1,158.1	0.0	1.1	0.0	0.0	0.0	1,268.5
Tonawanda, Town of	11,172.5	49.6	109.1	5.5	28.6	509.1	1,188.5
Wales, Town of	22,860.9	34.3	20.5	7.7	3.8	18,942.9	8,974.8
West Seneca, Town of	13,742.5	447.7	327.0	79.3	69.1	5,172.4	3,053.5
Williamsville, Village of	768.1	0.0	0.0	0.0	0.0	19.5	2.0
Erie County Total	669,669.3	5,596.6	4,311.7	1,253.1	667.5	389,831.9	232,168.8

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.13
Exposure to Wildfire Risk in Erie County – Improved Property**

Municipality	Total Improved Value	Value of Improved Property in Areas of High Wildfire Hazard Severity, Exacerbated by Development	Value of Improved Property in Areas of High Wildfire Hazard Severity	Value of Improved Property in Areas of Moderate Wildfire Hazard Severity, Exacerbated by Development	Value of Improved Property in Areas of Moderate Wildfire Hazard Severity	Value of Improved Property in Areas of Wildfire Risk Zone With Improved Property Present	Value of Improved Property in Areas of Wildfire Risk Zone Without Improved Property Present
Akron, Village of	\$147,386,383	\$4,835,114	\$0	\$2,964,264	\$0	\$62,599,229	\$0
Alden, Town of	\$596,764,911	\$13,668,058	\$0	\$12,961,975	\$0	\$558,370,664	\$0
Alden, Village of	\$113,968,804	\$5,649,727	\$0	\$681,732	\$0	\$69,656,101	\$0
Amherst, Town of	\$8,287,199,614	\$130,222,281	\$0	\$10,294,041	\$0	\$1,428,670,832	\$0
Angola, Village of	\$70,253,637	\$3,723,006	\$0	\$942,461	\$0	\$30,953,119	\$0
Aurora, Town of	\$732,629,812	\$18,570,153	\$0	\$5,199,338	\$0	\$885,246,514	\$0
Blasdell, Village of	\$105,746,861	\$249,152	\$0	\$113,689	\$0	\$4,721,712	\$0
Boston, Town of	\$395,564,101	\$9,768,134	\$0	\$10,479,232	\$0	\$511,296,438	\$0
Brant, Town of	\$80,726,326	\$2,629,543	\$0	\$481,780	\$0	\$85,951,181	\$0
Buffalo, City of	\$7,836,060,944	\$1,474,324	\$0	\$1,389,969	\$0	\$42,209,001	\$0
Cattaraugus Reservation	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cheektowaga, Town of	\$3,843,969,994	\$28,121,687	\$0	\$5,991,953	\$0	\$314,719,316	\$0
Clarence, Town of	\$2,451,434,606	\$73,403,659	\$0	\$13,589,840	\$0	\$1,289,055,367	\$0
Colden, Town of	\$210,932,688	\$4,376,186	\$0	\$640,632	\$0	\$313,770,128	\$0
Collins, Town of	\$140,401,209	\$5,175,850	\$0	\$1,581,007	\$0	\$161,425,186	\$0
Concord, Town of	\$266,337,175	\$2,270,634	\$0	\$266,347	\$0	\$357,965,003	\$0
Depew, Village of	\$687,275,077	\$2,049,421	\$0	\$685,892	\$0	\$36,732,098	\$0
East Aurora, Village of	\$502,982,763	\$13,504,167	\$0	\$1,340,923	\$0	\$203,173,063	\$0
Eden, Town of	\$508,945,663	\$16,037,026	\$0	\$4,206,208	\$0	\$442,800,470	\$0
Elma, Town of	\$963,279,568	\$26,451,863	\$0	\$9,631,923	\$0	\$1,089,061,550	\$0
Evans, Town of	\$688,158,533	\$28,902,177	\$0	\$5,692,218	\$0	\$567,531,342	\$0
Farnham, Village of	\$9,217,429	\$480,135	\$0	\$307,705	\$0	\$9,337,342	\$0
Gowanda, Village of	\$181,711,307	\$17,450,517	\$0	\$22,479	\$0	\$100,642,623	\$0
Grand Island, Town of	\$1,374,192,506	\$85,985,544	\$0	\$12,200,889	\$0	\$952,534,393	\$0
Hamburg, Town of	\$2,856,457,549	\$147,662,617	\$0	\$28,633,475	\$0	\$1,558,157,976	\$0
Hamburg, Village of	\$529,422,415	\$7,048,747	\$0	\$1,598,592	\$0	\$77,786,743	\$0
Holland, Town of	\$198,103,906	\$5,215,450	\$0	\$3,939,388	\$0	\$256,823,488	\$0
Kenmore, Village of	\$550,842,370	\$0	\$0	\$0	\$0	\$0	\$0
Lackawanna, City of	\$491,989,230	\$6,238,399	\$0	\$351,857	\$0	\$66,303,867	\$0
Lancaster, Town of	\$1,660,594,610	\$47,039,601	\$0	\$14,417,178	\$0	\$778,892,281	\$0

**SECTION 3C – RISK ASSESSMENT:
DAMAGE ESTIMATES**

**Table 3c.13
Exposure to Wildfire Risk in Erie County – Improved Property**

Municipality	Total Improved Value	Value of Improved Property in Areas of High Wildfire Hazard Severity, Exacerbated by Development	Value of Improved Property in Areas of High Wildfire Hazard Severity	Value of Improved Property in Areas of Moderate Wildfire Hazard Severity, Exacerbated by Development	Value of Improved Property in Areas of Moderate Wildfire Hazard Severity	Value of Improved Property in Areas of Wildfire Risk Zone With Improved Property Present	Value of Improved Property in Areas of Wildfire Risk Zone Without Improved Property Present
Lancaster, Village of	\$450,761,881	\$3,254,306	\$0	\$520,682	\$0	\$39,749,782	\$0
Marilla, Town of	\$311,762,654	\$4,185,965	\$0	\$3,543,391	\$0	\$288,792,027	\$0
Newstead, Town of	\$275,242,465	\$2,245,559	\$0	\$837,100	\$0	\$158,477,659	\$0
North Collins, Town of	\$98,650,414	\$827,635	\$0	\$576,548	\$0	\$97,511,425	\$0
North Collins, Village of	\$37,194,174	\$839,646	\$0	\$189,916	\$0	\$15,029,760	\$0
Orchard Park, Town of	\$2,336,738,931	\$128,719,711	\$0	\$21,494,793	\$0	\$1,996,124,574	\$0
Orchard Park, Village of	\$236,478,010	\$12,473,276	\$0	\$1,166,742	\$0	\$194,604,665	\$0
Sardinia, Town of	\$171,167,007	\$2,082,398	\$0	\$959,485	\$0	\$182,870,118	\$0
Sloan, Village of	\$88,611,517	\$0	\$0	\$0	\$0	\$0	\$0
Springville, Village of	\$251,444,560	\$8,875,419	\$0	\$802,369	\$0	\$108,182,592	\$0
Tonawanda, City of	\$554,227,967	\$824,525	\$0	\$321,705	\$0	\$13,807,821	\$0
Tonawanda Reservation	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tonawanda, Town of	\$3,937,290,613	\$12,782,892	\$0	\$5,916,964	\$0	\$221,817,003	\$0
Wales, Town of	\$184,189,527	\$2,102,739	\$0	\$763,444	\$0	\$218,224,175	\$0
West Seneca, Town of	\$2,487,649,101	\$94,921,855	\$0	\$13,428,760	\$0	\$909,281,086	\$0
Williamsville, Village of	\$313,415,097	\$0	\$0	\$0	\$0	\$4,625,639	\$0
Erie County Total	\$48,217,373,909	\$982,339,097	\$0	\$201,128,887	\$0	\$16,705,485,351	\$0

Estimated Damages – Wildfires

As described in Section 3a, available data such as the numbers and locations of wildfires and damages attributed to them was not sufficient at the time of the study to make meaningful estimates regarding damages due to wildfires. At this time, vulnerability is being expressed as the value of improvements exposed to the hazard, as presented in the “Hazard Profiles” section of this plan.

First, according to FEMA’s How-To #2, current loss estimation methodologies are not available for estimating wildfire damages. In addition, specific information would be required for buildings in order to develop alternate methodologies, such as type of construction, and details on any existing protective features. This data was not available as a part of the County GIS during this study.

Second, having even the year built data for each structure, one would be able to highlight structures built before codes and standards were adopted to make buildings more resistant to wildfire damage, thus being better candidates for mitigation. Without the year-built data, this cannot be done.

If this information should become available in the future, it could be incorporated into future updates of the plan. While one could make some blanket assumptions at this time to use various tools for loss estimation, this would likely yield erroneous data given the high degree of variation in type and density of development. Acting upon such rough estimates could result in an unwise use of limited resources.

Standard loss estimation methodologies are not currently available for estimating wildfire damages. Sufficient historical data regarding events and associated losses was not available to quantify here. For the purpose of this analysis, at this time we have determined that annual losses are unquantifiable. While damages associated with any single event could be significant, it is estimated that damages are most likely negligible when evaluated on an average annual basis.

Estimated Damages Summary

The following table (**Table 3c.14**) is a useful tool to summarize vulnerability in terms of annual damages estimated for various hazards in communities across the 44 municipalities that form Erie County. These estimated damages were developed for mitigation planning purposes only, and are not intended for use in any more formal benefit-cost analyses. During future updates of this plan, additional efforts should be made to seek out new sources of data and approved methodologies with which to estimate potential annualized dollar losses for those hazards that lack them in this current version of the plan.

Table 3c.14 Summary of Annual Loss Estimates by Municipality, All Natural Hazards *													
Municipality	Total Value of Improvements	Extreme Temperatures	Extreme Wind	Tornados	Winter Storms	Coastal Erosion	Flood	Ice Jams	Wave Action	Earthquakes	Expansive Soils	Landslides	Wildfire
Akron, Village of	\$147,386,383	U _N	U _S	\$255	U _S	U _N	\$3,058	\$0	\$0	\$2,666	U _N	U _N	U _N
Alden, Town of	\$596,764,911	U _N	U _S	\$1,031	U _S	U _N	\$58,642	U _N	\$0	\$10,794	U _N	U _N	U _N
Alden, Village of	\$113,968,804	U _N	U _S	\$197	U _S	U _N	\$1,379	\$0	\$0	\$2,061	U _N	U _N	U _N
Amherst, Town of	\$8,287,199,614	U _N	U _S	\$14,317	U _S	U _N	\$540,639	\$0	\$0	\$149,894	\$480,583	Us	U _N
Angola, Village of	\$70,253,637	U _N	U _S	\$121	U _S	U _N	\$1,231	\$0	\$0	\$1,271	U _N	U _N	U _N
Aurora, Town of	\$732,629,812	U _N	U _S	\$1,266	U _S	U _N	\$13,626	\$0	\$0	\$13,251	U _N	U _N	U _N
Blasdell, Village of	\$105,746,861	U _N	U _S	\$183	U _S	U _N	\$5,017	\$0	\$0	\$1,913	U _N	U _N	U _N
Boston, Town of	\$395,564,101	U _N	U _S	\$683	U _S	U _N	\$5,820	\$0	\$0	\$7,155	U _N	Us	U _N
Brant, Town of	\$80,726,326	U _N	U _S	\$139	U _S	U _S	\$847	\$0	U _S	\$1,460	U _N	U _N	U _N
Buffalo, City of	\$7,836,060,944	U _N	U _S	\$13,538	U _S	U _N	\$128,848	U _S	U _S	\$141,734	U _N	U _N	U _N
Cattaraugus Reservation	\$0			\$0			\$0			\$0			
Cheektowaga, Town of	\$3,843,969,994	U _N	U _S	\$6,641	U _S	U _N	\$53,837	U _N	\$0	\$69,528	U _N	Us	U _N
Clarence, Town of	\$2,451,434,606	U _N	U _S	\$4,235	U _S	U _N	\$134,391	\$0	\$0	\$44,340	U _N	Us	U _N
Colden, Town of	\$210,932,688	U _N	U _S	\$364	U _S	U _N	\$4,089	\$0	\$0	\$3,815	U _N	U _N	U _N
Collins, Town of	\$140,401,209	U _N	U _S	\$243	U _S	U _N	\$2,298	U _N	\$0	\$2,539	U _N	Us	U _N
Concord, Town of	\$266,337,175	U _N	U _S	\$460	U _S	U _N	\$2,937	\$0	\$0	\$4,817	U _N	Us	U _N
Depew, Village of	\$687,275,077	U _N	U _S	\$1,187	U _S	U _N	\$19,865	\$0	\$0	\$12,431	U _N	U _N	U _N
East Aurora, Village of	\$502,982,763	U _N	U _S	\$869	U _S	U _N	\$16,645	U _S	\$0	\$9,098	U _N	U _N	U _N
Eden, Town of	\$508,945,663	U _N	U _S	\$879	U _S	U _N	\$2,775	\$0	\$0	\$9,206	U _N	U _N	U _N
Elma, Town of	\$963,279,568	U _N	U _S	\$1,664	U _S	U _N	\$29,302	U _N	\$0	\$17,423	U _N	U _N	U _N
Evans, Town of	\$688,158,533	U _N	U _S	\$1,189	U _S	U _S	\$29,275	U _N	U _S	\$12,447	U _N	U _N	U _N
Farnham, Village of	\$9,217,429	U _N	U _S	\$16	U _S	U _N	\$0	\$0	\$0	\$167	U _N	U _N	U _N
Gowanda, Village of	\$181,711,307	U _N	U _S	\$314	U _S	U _N	\$25,989	U _S	\$0	\$3,287	U _N	U _N	U _N
Grand Island, Town of	\$1,374,192,506	U _N	U _S	\$2,374	U _S	U _N	\$66,439	\$0	\$0	\$24,856	U _N	U _N	U _N
Hamburg, Town of	\$2,856,457,549	U _N	U _S	\$4,935	U _S	U _S	\$44,594	\$0	U _S	\$51,666	U _N	U _N	U _N
Hamburg, Village of	\$529,422,415	U _N	U _S	\$915	U _S	U _N	\$2,223	\$0	\$0	\$9,576	U _N	U _N	U _N
Holland, Town of	\$198,103,906	U _N	U _S	\$342	U _S	U _N	\$5,741	\$0	\$0	\$3,583	U _N	U _N	U _N
Kenmore, Village of	\$550,842,370	U _N	U _S	\$952	U _S	U _N	\$0	\$0	\$0	\$9,963	U _N	U _N	U _N
Lackawanna, City of	\$491,989,230	U _N	U _S	\$850	U _S	U _N	\$51,248	U _N	U _S	\$8,899	U _N	U _N	U _N
Lancaster, Town of	\$1,660,594,610	U _N	U _S	\$2,869	U _S	U _N	\$68,727	\$0	\$0	\$30,036	U _N	Us	U _N
Lancaster, Village of	\$450,761,881	U _N	U _S	\$779	U _S	U _N	\$28,363	U _S	\$0	\$8,153	U _N	U _N	U _N
Marilla, Town of	\$311,762,654	U _N	U _S	\$539	U _S	U _N	\$9,241	\$0	\$0	\$5,639	U _N	U _N	U _N
Newstead, Town of	\$275,242,465	U _N	U _S	\$476	U _S	U _N	\$10,327	\$0	\$0	\$4,978	U _N	U _S	U _N
North Collins, Town of	\$98,650,414	U _N	U _S	\$170	U _S	U _N	\$0	\$0	\$0	\$1,784	U _N	U _N	U _N
North Collins, Village of	\$37,194,174	U _N	U _S	\$64	U _S	U _N	\$0	\$0	\$0	\$673	U _N	U _N	U _N
Orchard Park, Town of	\$2,336,738,931	U _N	U _S	\$4,037	U _S	U _N	\$35,940	\$0	\$0	\$42,266	U _N	U _N	U _N
Orchard Park, Village of	\$236,478,010	U _N	U _S	\$409	U _S	U _N	\$6,107	\$0	\$0	\$4,277	U _N	U _N	U _N
Sardinia, Town of	\$171,167,007	U _N	U _S	\$296	U _S	U _N	\$4,077	\$0	\$0	\$3,096	U _N	Us	U _N
Sloan, Village of	\$88,611,517	U _N	U _S	\$153	U _S	U _N	\$0	\$0	\$0	\$1,603	U _N	U _N	U _N
Springville, Village of	\$251,444,560	U _N	U _S	\$434	U _S	U _N	\$3,242	U _N	\$0	\$4,548	U _N	Us	U _N
Tonawanda, City of	\$554,227,967	U _N	U _S	\$957	U _S	U _N	\$3,489	U _S	\$0	\$10,025	U _N	U _N	U _N
Tonawanda Reservation	\$0			\$0			\$0			\$0			
Tonawanda, Town of	\$3,937,290,613	U _N	U _S	\$6,802	U _S	U _N	\$97,675	\$0	\$0	\$71,215	U _N	U _N	U _N
Wales, Town of	\$184,189,527	U _N	U _S	\$318	U _S	U _N	\$4,760	\$0	\$0	\$3,332	U _N	Us	U _N
West Seneca, Town of	\$2,487,649,101	U _N	U _S	\$4,298	U _S	U _N	\$135,018	U _S	\$0	\$44,995	U _N	U _N	U _N
Williamsville, Village of	\$313,415,097	U _N	U _S	\$541	U _S	U _N	\$17,282	U _N	\$0	\$5,669	U _N	U _N	U _N
Erie, County of	\$48,217,373,909	U_N	U_S	\$83,300	U_S	U_N	\$1,675,000	U_S	U_S	\$872,128	Us	Us	U_N

* It is important to note that this table reflects estimates of average annual damages. For any hazard, individual event damages could be substantially higher.
U_N: Annual losses currently unquantifiable but assumed to be negligible on an annual basis (less than \$5,000); individual event damages, however, could be significant.
U_S: Annual losses currently unquantifiable but assumed to be potentially significant on an annual basis (more than \$5,000); individual event damages, however, could be significant.

SECTION 3d - RISK ASSESSMENT: EXISTING LAND USES AND FUTURE DEVELOPMENT TRENDS IN HAZARD AREAS

Historic

As with much of Western New York, present-day Erie County had been inhabited by Native Americans for hundreds of years before its initial settlement by Europeans. In the late 1600's, the Senecas of the Iroquois Confederacy conquered the Neutrals, or Attawandaron, near present day Buffalo. Until approximately 1800, the Iroquois inhabited much of present day Erie County. Significant European settlement of the land began circa 1800 after the Holland Land Company extinguished Indian claims to the land, acquired the title to eight western-most counties of Western New York, surveyed their holdings, established towns, and began selling lots.

To settle the region's heavily wooded lands, the earliest settlers had to create clearings first for the purposes of constructing living spaces, and then for formation of cropland. A need to dispose of the land's timber brought about the construction of saw mills, along with asheries for the creation of potash. To make full use of their land, excess wood needed to be disposed of. The easiest way to accomplish this was to burn any wood not needed for fuel or construction.

In 1821, Erie County was created out of Niagara County, encompassing all of the land between Tonawanda Creek and Cattaraugus Creek. Settlement of Erie County expanded rapidly after the opening of the Erie Canal in 1825, with the City of Buffalo as its western terminus. Settlements were established at strategic locations on rivers, lakes and an evolving network of canal, rail and surface travel routes. Most development was characterized by clusters of settlements surrounded by small farmsteads. Early migration routes for settlers included the Erie Canal, Great Genesee Road, and the Mohawk or Iroquois Trail.

By 1900, Buffalo was the 8th largest city in the United States, and went on to become both a major railroad hub and the largest grain-milling center in the country. Steel mills and other heavy industry made use of the power afforded by local waterways, and the easy transport of goods via rail, the Erie Canal, and the great lakes. Erie County was a center of steel manufacture throughout most of the 20th century. In fact, at one time, the Bethlehem Steel plant was the fourth largest in the world, attracting many people to settle in the area for employment.

Between 1900 and 1940, Erie County's population boom continued. Growth was characterized by compact extensions to traditional settlements, including early 20th century suburbs. The post-war period of 1940 to 1960 saw further expansion of the county's population. The regions saw substantial development in new neighborhoods outside of the inner cities, at lower densities than the older neighborhoods. The region saw its first wave of suburban commercial (strip) development during this period as well.

From the 1960's to 2000, Erie County has continued to watch its population and households shift from the region's traditional urban and rural centers. Development has been characterized by a continued expansion of suburban areas through the 1990's despite an overall decline in population. Newer neighborhoods are served by commercial, civic and institutional uses lining major roads. Urbanized areas roughly tripled in size primarily due to spreading out of residential, commercial and institutional uses outward from the region's traditional centers.

Today, in certain inner city areas where population and household decline is greatest, housing values are dropping, demand for retail and commercial services is eroding, and in the most extreme cases, housing

stock is deteriorating and being abandoned. Early suburban (post-World War II) neighborhoods are starting to experience challenges similar to those faced by older communities – declining population, aging housing, vacated and underutilized commercial buildings and sites, and deteriorating infrastructure. Loss of rural, agricultural and environmentally-sensitive lands as low density development moves into rural areas and brings with it higher levels of impervious surfaces, less forest cover, increased reliance on septic systems and wells, and longer commutes.

The region's largest economic sectors are health care and education, which continue to grow despite the lagging national and worldwide economies. The retail sector of the economy is generally strong with additional revenue from Canadian shoppers. In partnership with Niagara County, Erie County has worked to develop the “Erie-Niagara Framework for Regional Development”, a Region-wide vision for conservation, development and public investment that also serves as the county’s own comprehensive plan. It is the policy of Erie County to follow the Framework in connection with all actions and decisions concerning growth and development in the County. As it is implemented, the Framework will:

- Improve the competitive position of the region’s centers of commerce, industry, and education.
- Promote efforts to improve the livability of urban neighborhoods and create more compact, walkable communities in developing areas. Accommodate anticipated growth on a smaller footprint, slow the pace of rural land conversion, ease pressure on the road network, lessen demand for new public infrastructure and facilities, and reduce long-term infrastructure operation and maintenance costs.
- Encourage rural economic development; the revitalization and modest expansion of rural villages and hamlets; the conservation of agricultural lands; and the protection of sensitive scenic and natural areas, wildlife habitat and open spaces.
- Design transportation infrastructure to promote reinvestment in developed areas, improve interstate and cross-border connectivity, strengthen alternative modes of transportation and enhance the livability of neighborhoods.
- Support public investment to maximize the use of existing infrastructure and facilities, improve the competitive position of underutilized lands and buildings, promote the reuse of brownfield and grayfield sites and encourage the preservation and adaptive reuse of historic sites and buildings.
- Support efforts to preserve historic sites and landscapes, conserve and improve access to natural systems and resources, and interpret history and celebrate regional culture.

Together, these principles will build upon Erie County’s past successes to overcome current obstacles and create a bright and sustainable future for generations to come.

Existing Land Use

Erie County is located in the western portion of New York State in what is known as the Buffalo–Niagara Falls Metropolitan Statistical Area. Lake Erie and the province of Ontario, Canada make up the western boundary of the County, and its eastern boundary is shared by Genesee and Wyoming Counties. Niagara County is located to the north and Chautauqua and Cattaraugus Counties are located to the south. According to the US Census Bureau, the County is 1,044 square miles in area (not including open water).

There are 44 municipal jurisdictions in addition to the County, with the City of Buffalo designated as the County seat. The county seat of Buffalo lies approximately 150 miles west of Syracuse, and roughly 300 miles west of Albany. The Countywide population as determined by the 2000 Census was 950,265 and in 2010 it was 919,040. The New York Statistical Information System at Cornell University projects the County’s population to decrease steadily hereafter through 2035, back to a level of only 772,086 (a 16

percent reduction). The Census 2010 population gives the County a population density of 880 people per square mile, while the population density for New York State overall is significantly lower at 410 people per square mile.

Erie County is the 8th most populous County in New York State, and the most populated county outside of the New York City metropolitan area.

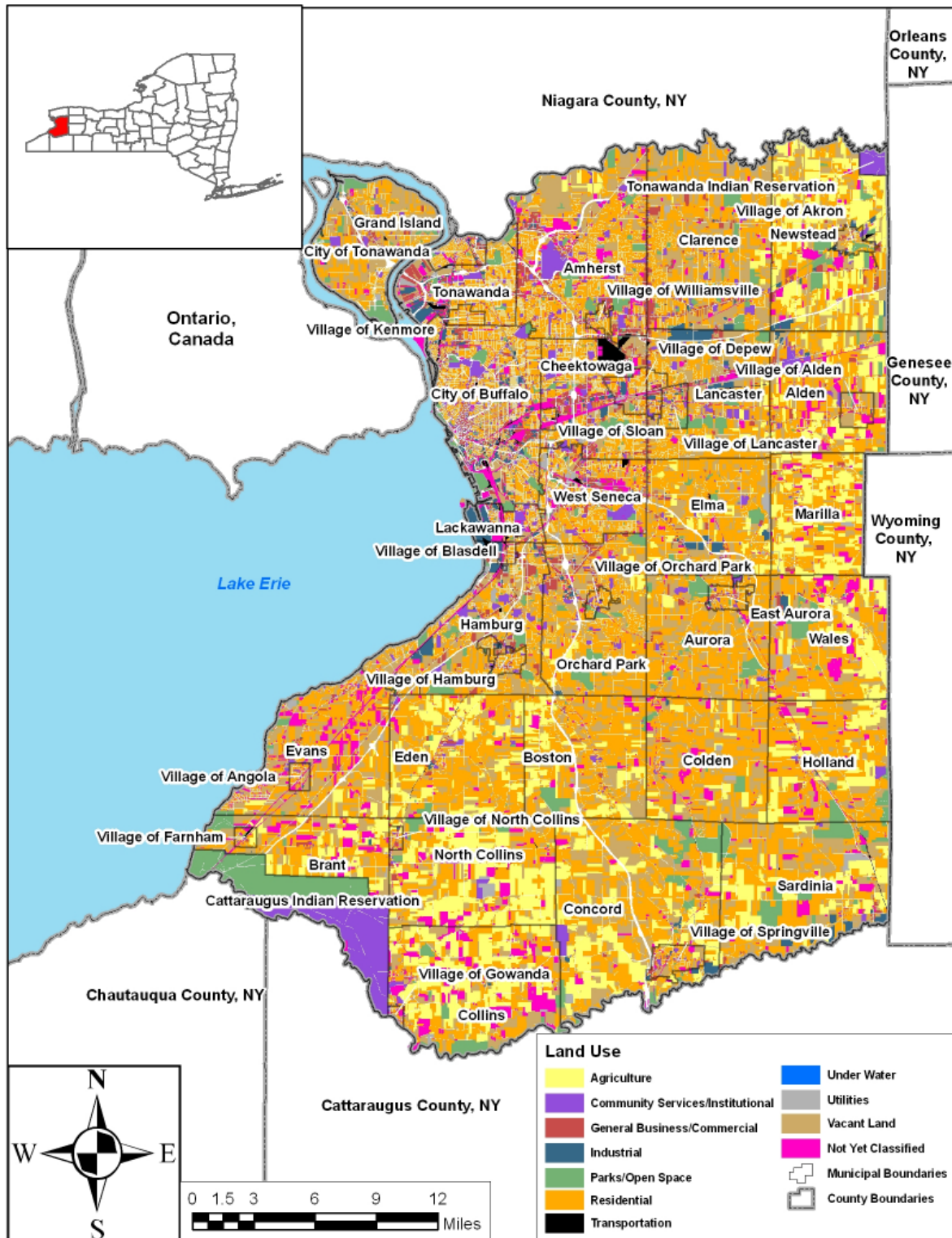
Figure 3d.1 presents a graphical depiction of land use in Erie County. The component data used to compile this figure is presented in **Tables 3d.1 and 3d.2**, which present total acreages of land currently under various land use categories and their relative percentages within each municipality and in the County overall.

Much of the northwest quarter of Erie County includes the heavily urbanized areas of the City of Buffalo, and its surrounding suburbs, including the City of Lackawanna. This urbanization extends north into Niagara County, through the City of Niagara Falls (approximately 20 miles from Downtown Buffalo). Meanwhile the easternmost towns within Erie County and the southern half of the county remain primarily rural in nature with numerous smaller hamlets and villages. Approximately 41.9 percent of the county's land area is currently residential, 20.5 percent is vacant land, 14.5 percent is agricultural, 4.7 percent is dedicated to community services, 3.8 percent commercial, and 3.5 percent representing wild, forested, conservation lands and public parks. The remaining 11.2 percent is comprised of lands used for recreation and entertainment, industrial, public services, and lands not yet classified.

Significant areas of designated protected undeveloped land include the following:

<u>Location</u>	<u>Approximate Number of Acres</u>
• Zoar Valley State Multiple Use Area	1,000
• Sprague Brook County Park	1,000
• Hunter's Creek County Park	800
• Beaver Island State Park	800
• Buckhorn Island State Park	600
• Knox Farm State Park	600
• Evangola State Park	500
• Eighteen Mile Creek County Park	500
• Emery County Park	500
• Beeman Creek County Park	400

Figure 3d.1: Erie County Land Use



SOURCE: ESRI, U.S. Counties, 2005, Erie County Municipal Boundaries, Area Hyrdography, 2007, Erie County Tax Parcels.

Table 3d.1
Land Use Acreage Breakdowns by Municipality (Acres)

Municipality	Agricultural	General Business/Commercial	Community Services/Institutional	Industrial	Parks/Open Space	Residential	Transportation	Utilities	Vacant Land	Not Yet Classified	Total Area of Municipality (Acres)
Akron, Village of	48.6	67.9	42.4	58.8	158.5	401.4	0.0	16.6	317.7	9.1	1,228.0
Alden, Town of	4,438.0	393.2	1,072.1	114.7	299.0	8,226.1	0.0	179.1	3,279.2	1,812.4	20,394.4
Alden, Village of	81.5	74.1	13.8	10.9	62.7	484.3	0.0	10.5	674.1	215.7	1,711.5
Amherst, Town of	547.7	2,290.0	2,465.2	61.4	1,922.1	12,476.9	35.6	188.2	6,635.2	2,215.2	33,488.6
Angola, Village of	0.0	20.3	47.1	13.2	0.0	299.9	0.0	11.2	266.1	124.2	869.6
Aurora, Town of	321.9	262.9	394.7	9.4	1,360.4	12,534.4	0.0	62.3	5,470.1	365.4	21,739.4
Blasdell, Village of	0.0	83.2	25.7	111.9	5.1	140.7	21.2	24.4	83.7	67.5	635.6
Boston, Town of	4,004.3	149.8	142.7	3.7	852.6	11,148.1	0.0	135.1	4,537.8	720.2	22,926.1
Brant, Town of	3,469.4	203.8	41.4	33.4	581.1	5,325.6	0.0	56.2	3,039.0	1,616.0	14,900.8
Buffalo, City of	0.0	2,552.0	1,763.8	1,299.8	2,041.5	7,897.8	311.6	196.2	3,078.1	2,178.9	26,275.3
Cattaraugus Reservation	0.0	0.0	9,336.7	0.0	6,736.2	2.5	0.0	0.0	0.0	40.3	16,458.1
Cheektowaga, Town of	0.0	1,929.6	1,169.3	347.3	893.8	5,263.7	876.1	367.4	1,797.7	983.2	16,292.4
Clarence, Town of	456.6	1,504.6	906.2	256.5	1,677.3	16,359.6	1.4	223.7	10,435.2	674.7	34,321.3
Colden, Town of	1,824.1	106.7	59.6	34.3	421.9	12,183.9	1.1	149.7	6,388.5	1,162.0	22,830.7
Collins, Town of	9,950.1	90.3	219.5	45.3	1,674.2	8,651.8	0.0	133.4	4,230.7	4,533.9	30,405.8
Concord, Town of	9,473.1	94.5	550.7	436.9	2,613.1	17,453.4	2.1	320.5	8,915.5	862.2	42,641.2
Depew, Village of	0.0	406.8	152.3	190.6	59.6	1,114.2	10.1	96.8	427.6	264.0	3,228.1
East Aurora, Village of	0.0	124.6	167.3	46.1	69.4	745.6	1.9	21.3	173.8	49.2	1,590.2
Eden, Town of	6,111.4	265.5	303.6	52.3	354.6	12,884.4	47.0	170.8	3,914.6	584.0	25,517.9
Elma, Town of	1,751.2	483.6	288.2	528.7	825.8	11,930.0	26.7	451.3	4,339.8	235.4	22,116.0
Evans, Town of	1,185.6	361.9	199.7	26.0	524.7	10,974.7	0.4	200.3	7,468.7	3,171.6	25,727.4
Farnham, Village of	152.0	13.2	16.2	0.0	13.2	241.9	29.7	1.6	72.7	85.4	652.0
Gowanda, Village of	0.0	37.6	26.2	0.0	2.8	105.1	0.0	21.0	51.3	70.5	359.8
Grand Island, Town of	6.3	566.7	642.3	155.4	1,950.5	6,663.0	18.9	288.5	5,878.3	296.7	18,180.7
Hamburg, Town of	102.3	1,484.4	1,076.5	880.6	1,828.5	8,956.6	179.1	276.7	6,219.6	550.4	24,224.8
Hamburg, Village of	0.0	127.5	112.4	30.9	47.4	815.5	9.2	5.8	141.4	10.0	1,523.6
Holland, Town of	4,426.1	207.3	287.6	42.1	1,024.1	11,222.4	0.0	21.7	3,803.7	1,367.7	22,874.0
Kenmore, Village of	0.0	68.8	30.0	1.9	18.7	569.9	0.0	0.1	5.2	2.6	916.0
Lackawanna, City of	0.0	184.0	360.5	1,088.1	48.1	877.6	135.6	39.5	381.3	653.6	4,231.7
Lancaster, Town of	729.9	983.6	646.9	1,309.1	1,257.6	8,043.4	59.7	156.5	6,257.1	581.1	21,394.0
Lancaster, Village of	0.0	109.6	120.2	65.6	151.9	756.6	0.0	4.0	212.0	64.7	1,758.9
Marilla, Town of	6,186.8	166.8	47.5	0.0	91.2	7,847.2	0.0	161.8	1,469.6	1,078.7	17,546.4
Newstead, Town of	11,957.7	524.9	147.5	493.0	1,453.1	9,057.3	44.1	15.6	5,221.4	1,320.7	31,404.9
North Collins, Town of	11,556.2	124.2	286.5	0.0	688.4	7,813.5	2.8	368.2	3,427.8	2,063.6	27,008.7
North Collins, Village of	81.2	60.4	17.6	10.4	2.2	195.6	0.0	4.8	62.5	21.6	501.9
Orchard Park, Town of	875.3	986.1	631.0	178.7	1,758.7	11,479.6	0.2	110.3	5,488.6	340.7	23,807.9
Orchard Park, Village of	0.0	47.8	75.3	4.8	66.4	491.0	0.9	0.0	60.7	9.1	863.2
Sardinia, Town of	5,802.2	251.4	136.6	697.6	2,941.4	13,796.4	70.3	449.9	6,182.8	1,090.5	32,214.5
Sloan, Village of	0.0	41.6	16.9	6.8	6.8	182.4	15.7	3.6	47.9	107.8	502.5
Springville, Village of	187.7	203.5	123.6	43.8	16.1	826.5	2.6	23.4	532.8	151.4	2,325.0
Tonawanda, City of	0.0	272.7	88.7	109.3	117.6	898.8	13.6	42.9	179.4	132.6	2,378.7
Tonawanda Reservation	0.0	0.0	1,146.9	0.0			0.0	0.0	0.0		1,158.1
Tonawanda, Town of	0.0	1,306.3	540.9	795.0	813.3	3,508.8	152.4	443.8	1,087.2	652.6	11,172.5
Wales, Town of	4,954.0	172.2	27.4	178.3	944.2	9,729.0	0.0	261.9	4,044.5	1,999.2	22,860.9
West Seneca, Town of	43.7	1,056.1	1,020.1	69.8	316.2	5,815.9	119.4	656.7	1,638.7	960.5	13,742.5
Williamsville, Village of	0.0	67.7	42.4	0.7	27.0	448.0	2.2	0.6	16.4	23.3	768.1
Erie County Total	90,724.8	20,529.8	27,029.4	9,842.8	38,719.1	266,841.1	2,191.7	6,373.7	127,956.5	35,520.1	669,669.3

*Acreage totals reflect the Erie County Parcel boundary. Waterways and Roadways are not included in acreage totals.

Table 3d.2 Land Use Percentage Breakdowns by Municipality											
Municipality	Agricultural	General Business/Commercial	Community Services/Institutional	Industrial	Parks/Open Space	Residential	Transportation	Utilities	Vacant Land	Not Yet Classified	Municipal Percent of County Area
Akron, Village of	4.0%	5.5%	3.4%	4.8%	12.9%	32.7%	0.0%	1.4%	25.9%	0.7%	0.2%
Alden, Town of	21.8%	1.9%	5.3%	0.6%	1.5%	40.3%	0.0%	0.9%	16.1%	8.9%	3.0%
Alden, Village of	4.8%	4.3%	0.8%	0.6%	3.7%	28.3%	0.0%	0.6%	39.4%	12.6%	0.3%
Amherst, Town of	1.6%	6.8%	7.4%	0.2%	5.7%	37.3%	0.1%	0.6%	19.8%	6.6%	5.0%
Angola, Village of	0.0%	2.3%	5.4%	1.5%	0.0%	34.5%	0.0%	1.3%	30.6%	14.3%	0.1%
Aurora, Town of	1.5%	1.2%	1.8%	0.0%	6.3%	57.7%	0.0%	0.3%	25.2%	1.7%	3.2%
Blasdell, Village of	0.0%	13.1%	4.0%	17.6%	0.8%	22.1%	3.3%	3.8%	13.2%	10.6%	0.1%
Boston, Town of	17.5%	0.7%	0.6%	0.0%	3.7%	48.6%	0.0%	0.6%	19.8%	3.1%	3.4%
Brant, Town of	23.3%	1.4%	0.3%	0.2%	3.9%	35.7%	0.0%	0.4%	20.4%	10.8%	2.2%
Buffalo, City of	0.0%	9.7%	6.7%	4.9%	7.8%	30.1%	1.2%	0.7%	11.7%	8.3%	3.9%
Cattaraugus Reservation	0.0%	0.0%	56.7%	0.0%	40.9%	0.0%	0.0%	0.0%	0.0%	0.2%	2.5%
Cheektowaga, Town of	0.0%	11.8%	7.2%	2.1%	5.5%	32.3%	5.4%	2.3%	11.0%	6.0%	2.4%
Clarence, Town of	1.3%	4.4%	2.6%	0.7%	4.9%	47.7%	0.0%	0.7%	30.4%	2.0%	5.1%
Colden, Town of	8.0%	0.5%	0.3%	0.2%	1.8%	53.4%	0.0%	0.7%	28.0%	5.1%	3.4%
Collins, Town of	32.7%	0.3%	0.7%	0.1%	5.5%	28.5%	0.0%	0.4%	13.9%	14.9%	4.5%
Concord, Town of	22.2%	0.2%	1.3%	1.0%	6.1%	40.9%	0.0%	0.8%	20.9%	2.0%	6.4%
Depew, Village of	0.0%	12.6%	4.7%	5.9%	1.8%	34.5%	0.3%	3.0%	13.2%	8.2%	0.5%
East Aurora, Village of	0.0%	7.8%	10.5%	2.9%	4.4%	46.9%	0.1%	1.3%	10.9%	3.1%	0.2%
Eden, Town of	23.9%	1.0%	1.2%	0.2%	1.4%	50.5%	0.2%	0.7%	15.3%	2.3%	3.8%
Elma, Town of	7.9%	2.2%	1.3%	2.4%	3.7%	53.9%	0.1%	2.0%	19.6%	1.1%	3.3%
Evans, Town of	4.6%	1.4%	0.8%	0.1%	2.0%	42.7%	0.0%	0.8%	29.0%	12.3%	3.8%
Farnham, Village of	23.3%	2.0%	2.5%	0.0%	2.0%	37.1%	4.6%	0.3%	11.2%	13.1%	0.1%
Gowanda, Village of	0.0%	10.4%	7.3%	0.0%	0.8%	29.2%	0.0%	5.8%	14.3%	19.6%	0.1%
Grand Island, Town of	0.0%	3.1%	3.5%	0.9%	10.7%	36.6%	0.1%	1.6%	32.3%	1.6%	2.7%
Hamburg, Town of	0.4%	6.1%	4.4%	3.6%	7.5%	37.0%	0.7%	1.1%	25.7%	2.3%	3.6%
Hamburg, Village of	0.0%	8.4%	7.4%	2.0%	3.1%	53.5%	0.6%	0.4%	9.3%	0.7%	0.2%
Holland, Town of	19.3%	0.9%	1.3%	0.2%	4.5%	49.1%	0.0%	0.1%	16.6%	6.0%	3.4%
Kenmore, Village of	0.0%	7.5%	3.3%	0.2%	2.0%	62.2%	0.0%	0.0%	0.6%	0.3%	0.1%
Lackawanna, City of	0.0%	4.3%	8.5%	25.7%	1.1%	20.7%	3.2%	0.9%	9.0%	15.4%	0.6%
Lancaster, Town of	3.4%	4.6%	3.0%	6.1%	5.9%	37.6%	0.3%	0.7%	29.2%	2.7%	3.2%
Lancaster, Village of	0.0%	6.2%	6.8%	3.7%	8.6%	43.0%	0.0%	0.2%	12.1%	3.7%	0.3%
Marilla, Town of	35.3%	1.0%	0.3%	0.0%	0.5%	44.7%	0.0%	0.9%	8.4%	6.1%	2.6%
Newstead, Town of	38.1%	1.7%	0.5%	1.6%	4.6%	28.8%	0.1%	0.0%	16.6%	4.2%	4.7%
North Collins, Town of	42.8%	0.5%	1.1%	0.0%	2.5%	28.9%	0.0%	1.4%	12.7%	7.6%	4.0%
North Collins, Village of	16.2%	12.0%	3.5%	2.1%	0.4%	39.0%	0.0%	1.0%	12.5%	4.3%	0.1%
Orchard Park, Town of	3.7%	4.1%	2.7%	0.8%	7.4%	48.2%	0.0%	0.5%	23.1%	1.4%	3.6%
Orchard Park, Village of	0.0%	5.5%	8.7%	0.6%	7.7%	56.9%	0.1%	0.0%	7.0%	1.1%	0.1%
Sardinia, Town of	18.0%	0.8%	0.4%	2.2%	9.1%	42.8%	0.2%	1.4%	19.2%	3.4%	4.8%
Sloan, Village of	0.0%	8.3%	3.4%	1.4%	1.3%	36.3%	3.1%	0.7%	9.5%	21.5%	0.1%
Springville, Village of	8.1%	8.8%	5.3%	1.9%	0.7%	35.5%	0.1%	1.0%	22.9%	6.5%	0.3%
Tonawanda, City of	0.0%	11.5%	3.7%	4.6%	4.9%	37.8%	0.6%	1.8%	7.5%	5.6%	0.4%
Tonawanda Reservation	0.0%	0.0%	99.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Tonawanda, Town of	0.0%	11.7%	4.8%	7.1%	7.3%	31.4%	1.4%	4.0%	9.7%	5.8%	1.7%
Wales, Town of	21.7%	0.8%	0.1%	0.8%	4.1%	42.6%	0.0%	1.1%	17.7%	8.7%	3.4%
West Seneca, Town of	0.3%	7.7%	7.4%	0.5%	2.3%	42.3%	0.9%	4.8%	11.9%	7.0%	2.1%
Williamsville, Village of	0.0%	8.8%	5.5%	0.1%	3.5%	58.3%	0.3%	0.1%	2.1%	3.0%	0.1%
Erie County Total	13.5%	3.1%	4.0%	1.5%	5.8%	39.8%	0.3%	1.0%	19.1%	5.3%	100.0%

Land Use Planning

In New York State, traditional planning authority is granted to municipal government, including the regulation of land use through zoning and land subdivision. Counties serve a coordination function for those elements that are best served on a regional level, reviewing and commenting on many local land use decisions. The authority to approve or disapprove proposals, however, rests in the hands of the local municipalities. The Erie County Department of Environment and Planning coordinates, supports, and implements planning programs and development projects that improve the quality of life for Erie County residents, businesses, and visitors. The Department's focus areas include: Economic Development; Community Development; Regional Planning; Environmental Services; Arts, Culture and Heritage Promotion; Geographic Information Services; and Sewerage Management.

Department personnel manage a number of planning programs that make Erie County a better place to live, work and play. Each program either plans for or implements development projects that are consistent with the “Erie-Niagara Framework for Regional Growth” (the County’s adopted comprehensive plan) and that create a sense of place in communities that enrich people’s lives. The Department follows the Framework in connection with all actions and decisions concerning growth and development in the County. It:

- leads the planning and construction of waterfront land use and access projects;
- conducts reviews and makes recommendations concerning certain development projects submitted by municipalities; provides training and technical assistance to municipal boards, including planning and zoning boards;
- serves as the environmental review “coordinator” for Erie County actions (capital projects, physical construction, plan & policy making, laws ordinances, executive orders and regulations) undertaken, funded or approved by the county, that may affect the environment by changing the use, appearance or condition of any natural resource or structure;
- responds to environmental reviews of municipal government actions which involve county funding or approvals; reviews proposed County land acquisitions, transfers or sales in accordance with state and local laws and for consistency with the Framework for Regional Growth;
- plays a lead role in coordination and review of proposed capital projects, manages the environmental review process for capital projects, and reviews capital projects for consistency with the Framework for Region Growth; and
- supports the County’s vibrant agricultural economy through farmland protection programs including countywide agricultural and farmland protection planning and agricultural district establishment, renewals and annual additions, and provides administrative and policy support to the Erie County Agricultural and Farmland Protection Board.

Based on information provided by the municipalities as part of the first plan update (2011-2012), administration and enforcement of the New York State Uniform Fire Prevention and Building Code (Uniform Code) occurs at the local level in all participating jurisdictions. Further, all participating jurisdictions reported having zoning statutes and comprehensive/master plans; and 38 of the 41 participating jurisdictions reported having subdivision statutes. **Table 3d.3** presents a summary of these standard land use regulation tools by municipality.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.3
County Communities with Land Use Regulations
(Source: Capability Assessment Questionnaire Responses)

Municipality	Building Code	Zoning Statutes	Subdivision Statutes	Comprehensive /Master Plan
Akron, Village of	√	√	√	√
Alden, Town of	√	√	√	√
Alden, Village of	√	√	√	√
Amherst, Town of	√	√	√	√
Angola, Village of	√	√	√	√
Aurora, Town of	√	√	√	√
Blasdell, Village of	√	√		√
Boston, Town of	√	√	√	√
Brant, Town of	√	√		√
Buffalo, City of	√	√	√	√
Cheektowaga, Town of	√	√	√	√
Clarence, Town of	√	√	√	√
Colden, Town of	√	√	√	√
Collins, Town of	√	√	√	√
Concord, Town of	√	√	√	√
Depew, Village of	√	√	√	√
East Aurora, Village of	√	√	√	√
Eden, Town of	√	√	√	√
Elma, Town of	√	√	√	√
Evans, Town of	√	√	√	√
Farnham, Village of	Did not participate			
Gowanda, Village of	√	√	√	√
Grand Island, Town of	√	√	√	√
Hamburg, Town of	√	√	√	√
Hamburg, Village of	√	√	√	√
Holland, Town of	√	√	√	√
Kenmore, Village of	√	√	√	√
Lackawanna, City of	√	√	√	√
Lancaster, Town of	√	√	√	√
Lancaster, Village of	√	√	√	√
Marilla, Town of	√	√	√	√
Newstead, Town of	√	√	√	√
North Collins, Town of	√	√	√	√
North Collins, Village of	√	√	√	√
Orchard Park, Town of	√	√	√	√
Orchard Park, Village of	√	√	√	√
Sardinia, Town of	√	√	√	√
Sloan, Village of	√	√		√
Springville, Village of	√	√	√	√
Tonawanda, City of	√	√	√	√
Tonawanda, Town of	√	√	√	√
Wales, Town of	Did not participate			
West Seneca, Town of	√	√	√	√
Williamsville, Village of	√	√	√	√

At both the County and municipal levels, land use and development planners in departments, federations, boards and councils are active in guiding Erie County's growth and work toward providing a unified framework for development that coordinates activities between municipalities and the County overall.

Recent Development Trends – County Overview

Recent development trends in Erie County, as reported in the Framework of 2006 (see **Figure 3d.2**), had generally been characterized by a loss of rural, agricultural and environmentally-sensitive lands as low density development moved into rural areas, bringing with it higher levels of impervious surfaces, less forest cover, increased reliance on septic systems and wells, and longer commutes.

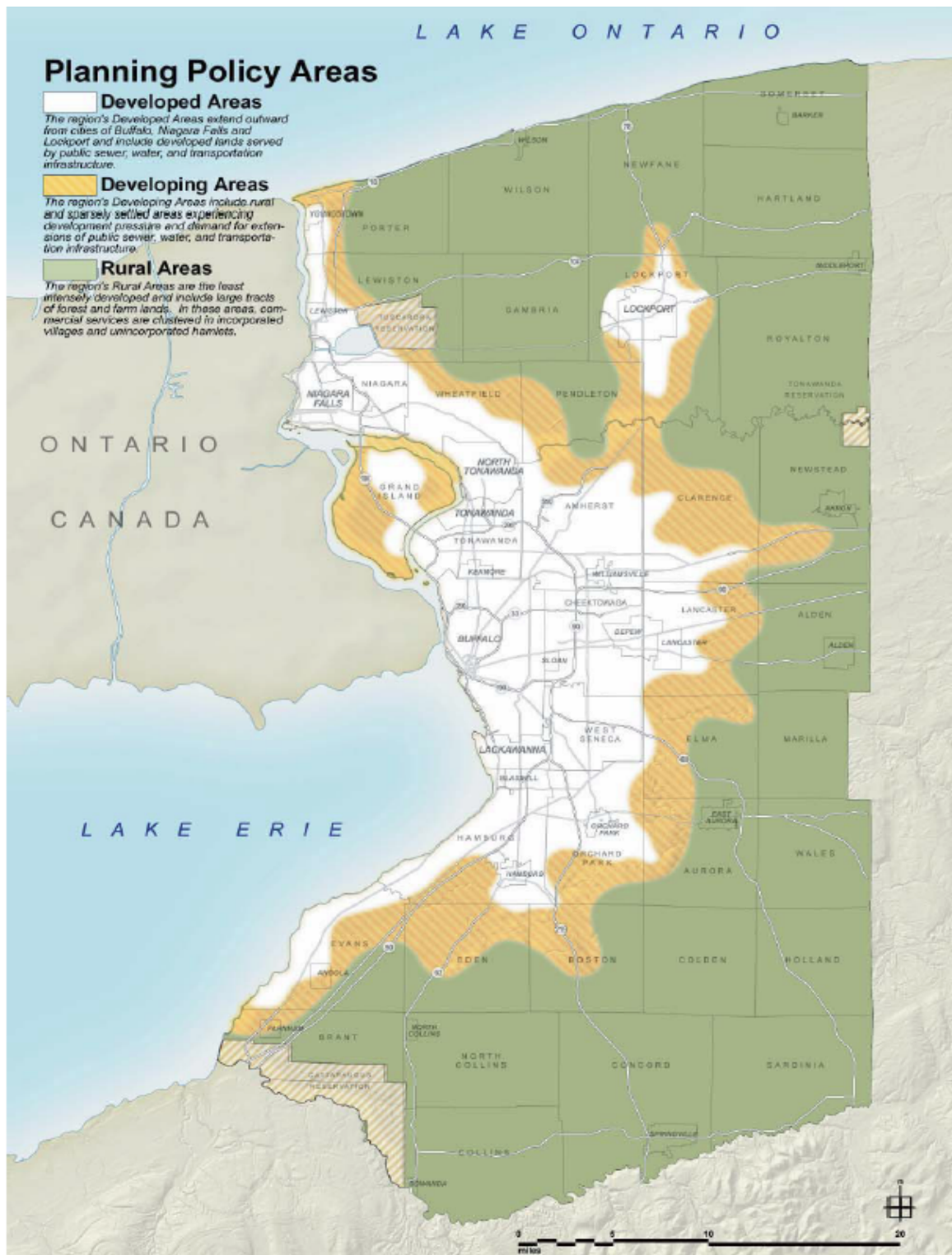
Developed Areas saw declines in older urban centers and new moderate-density development in newer suburban areas with public sewer and water service. Twenty-five percent of new households were constructed in Developed areas, at a density of four households per acre.

In Developing Areas, low-density, dispersed development resulted in the conversion of rural and agricultural lands and continued demand for extensions of public sewer, water, and transportation infrastructure. Forty percent of new households were constructed in Developing Areas, at a density of two households per acre.

As in Developing Areas, low-density, dispersed development resulted in the conversion of rural and agricultural lands and a continued demand for extensions of public sewer, water, and transportation infrastructure in the Rural Areas. Thirty-five percent of the County's new households were constructed in rural areas, at a density of 0.5 households per acre.

Note that density assignments in the Framework were based on a review of development densities between 1980 and 2000.

Figure 3d.2 – Erie County Planning Policy Areas ¹



¹ Source: Erie-Niagara Framework for Regional Growth

Future Development Trends – County Overview

Erie County is striving to achieve new development in a manner that is sustainable and adds to the character, desirability, and quality of its rural areas while minimizing the potential to negatively impact current communities and their transportation systems, infrastructure, open space and parks, and quality of life. It is likely that, in the future, Erie County will continue to balance the pressures of supporting its agricultural communities while fostering the development of new industries.

The County's comprehensive plan presents recommendations for future development based on a broad vision for a region with strong urban and rural centers; safe, sustainable neighborhoods; compact forms of new development; and conserved rural landscapes and natural systems. Framework policies and strategies call for most new housing to occur in the Developed Area with only modest increases in households in the developing and rural areas.

The targeted distribution of new households through 2025, as presented in the Framework, involves 70 percent in Developed Areas, 15 percent in Developing Areas and 15 percent in Rural Areas. The County's policies and strategies support the location of most new households in existing developed areas with modest increases in developing and rural areas. Moderate density development is targeted for developed areas (areas currently served with public sewer, water and transportation infrastructure). Development in Developing and Rural Areas is targeted for locations in and around areas with sewer and water service, requiring minimal investment in infrastructure and minimal disturbance of rural and agricultural lands. Density assignments assume modest increases in densities in developed and developing areas and concentration of new housing in and around rural centers in rural areas.

Future Development Trends in Each Municipality

A "Land Uses and Development Trends Questionnaire" was distributed to all jurisdictions in the County and asked jurisdictions to:

- (1) describe development trends occurring within their jurisdiction, such as the predominant types of development occurring, location, expected intensity, and pace by land use; and
- (2) describe any regulations/ordinances/codes their jurisdiction enforces to protect new development from the effects of natural hazards.

A full summary of responses contained within all the completed Land Use and Development Questionnaires returned by individual jurisdictions is presented in **Table 3d.4**.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4
Summary of Responses, Land Uses and Development Trends Worksheet
(Source: Core Planning Group Members)

Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
Akron, Village of	Within the Village of Akron there is currently development taking place to build high density single family housing in an area which was previously undeveloped woodland. There is also some limited expansion taking place at existing light industrial locations in the Village. Sporadic individual single family residential development is taking place in other areas, but in small volume within Village limits.	The Village of Akron has had a floodplain protection ordinance in operation since March 1987.
Alden, Town of	Minimal farmland left for development. Erie County Home to become vacant in 2013 - unknown development issue.	Yes, through the floodplain management program.
Alden, Village of	Village is fairly developed - only small plots of land available.	Yes, through the floodplain management program.
Amherst, Town of	According to our Planning and Building Depts. We have seen the residential projects level off but we are seeing a surge in re-development of the commercial areas of the town.	Yes, our community has a strict zoning code as it relates to our floodplain. This is enforced by the code enforcement officers of our Town Building Dept. and is also reviewed during the plans review. Our Planning Dept. is responsible for the administrative oversight of our Zoning Ordinances.
Angola, Village of	Senior citizen housing is being constructed in the Village within ¼ mile of the CSX railroad tracks. Quantity and speed of trains, especially Ethanol trains twice a day with the possibility of derailment.	Yes, by enforcing the building portion of the Flood Damage Prevention Ordinance.
Aurora, Town of	The Town, mostly agrarian owned by older farmers, is experiencing a rapid growth of one family dwellings, one family developments, and multi-family townhouses. An expansive 40 acre senior housing/community project is on hold because of 'pilot' issues. The recent extension of hydrant grids throughout the town is anticipated to support an increase in development.	The building department (severely underfunded and understaffed) works with the local fire departments and Disaster Planning Department to assure that new construction complies with many aspects of hazard mitigation. Hazards associated with setbacks and floodplain construction are clearly and consistently reviewed when all development plans are considered. And the input of fire and disaster agencies are sought where existing policies and ordinances do not provide guidance of a particular issue.
Blasdell, Village of	The Village of Blasdell has no new development occurring at this time. The Village has very little open space remaining for any type of development.	The Village does enforce its codes and ordinances through the Town of Hamburg Building Inspection Department, but presently we have no new development occurring.
Boston, Town of	Mixed housing - lightweight construction of mobile homes in close proximity to 15-mile Creek. Commercial buildings taking former green spaces/farm land and constructing Facilities.	Yes, the Town Planning Board and Zoning Board review each application to ensure compliant with not only local codes, but also state and federal variables. SEQR compliance and NFIP are two of the most important addressed.
Brant, Town of	Some residential development on lakefront but mostly agricultural throughout Town.	Working on floodplain management entering FEMA regulations for new construction in floodplains.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4
Summary of Responses, Land Uses and Development Trends Worksheet
(Source: Core Planning Group Members)

Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
Buffalo, City of	The City of Buffalo is experiencing rapid growth along its waterfront that is inclusive of residential and commercial use. With this, there has also been a marked increase of high density entertainment venues established in this area. Additionally, there has been rapid growth in our High Tech Medical Corridor and in the residential use of buildings, existing and new, in our downtown area.	Yes, through the City of Buffalo Department of Inspections and permits, all plans for new development of residential and commercial construction are reviewed. As part of this process, the department determines the applicable building codes for that structure.
Cheektowaga, Town of	Development of hotels in the vicinity of the airport. Continued retail development around Galleria Mall, including proposal for two small hotels. Most of what we see is redevelopment (i.e., retail replaces industrial) or underutilized sites redeveloped with more efficiency and increased density.	The Town flood damage prevention ordinance provides the regulatory authority to enforce floodplain development and to enforce the provisions of the NFIP. The Town drainage systems ordinance and storm water management and erosion and sediment control regulations further regulate site development. New York State building codes set forth seismic and wind design requirements.
Clarence, Town of	We are seeing a slight increase in residential new builds and have seen an increase in residential remodels and additions. Commercial development has leveled off.	Yes. The Town of Clarence operates within the boundaries of the Master Plan relative to zoning. We have a very clear and thorough flood damage prevention ordinance. All building permits and development plans are reviewed for compliance with the flood damage prevention ordinance. The planning department administers the zoning ordinances.
Colden, Town of	Agricultural development is encouraged. Right-to-Farm has been adopted. Single family residential and light commercial development continues at a slow to moderate pace throughout the Town. No nearby commercial, industrial, or subdivision development is currently proposed.	Adopting the floodplain ordinance recently has let us update our codes and regulations. Currently working on the floodplain maps and CRS.
Collins, Town of	The Town of Collins is a rural, farming community that includes three, medium-density residential centers (the Village of Gowanda and Hamlets of Collins and Collins Center). Two NYS correctional facilities are situated in the western end of Town. The Town has a relatively low residential development history.	Code Enforcement Officer acts as Floodplain Administrator and follows NFIP regulations.
Concord, Town of	Development in Town has slowed due to current economic conditions. There have been some minor residential projects (single family homes) and few light commercial projects over the last five years.	The Town has a Code Enforcement Officer that reviews and oversees construction projects. The NYS Building Code is used to ensure proper building methods and materials are used. The Town also utilizes ordinances to prohibit building in identified hazard areas. Major projects also reviewed by the local planning board, zoning board, and Industrial Development Agency to ensure positive impact to the community.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4
Summary of Responses, Land Uses and Development Trends Worksheet
(Source: Core Planning Group Members)

Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
Depew, Village of	The Village of Depew was incorporated in 1894. Over the past 115 years since its incorporation, the Village has evolved into a mixed use community with virtually all developable land used for one purpose. There is a broad mix of suburban residential areas, commercial retail areas and industrial use areas developed within the Village. Currently there are no major development activities ongoing within the Village. One large parcel within the Village (a former commercial printing plant) will close in 2011 and may be subject to re-use or redevelopment in the coming years. The fate of that property will largely be determined by the owner's ability to remediate environmental concerns and prepare the building/site for potential re-use or redevelopment.	NYS Department of Environmental Conservation laws are enforced with respect to enforcing development activities within the floodplains. Depew Village Code Chapter 109 describes floodplain management activities. Other areas of the Village Code and the Zoning Plan specifically limit or regulate the development of various industrial and commercial ventures that could present a hazard to the community.
East Aurora, Village of	The Village of East Aurora is virtually without space for development. There is a dearth of available senior housing and housing for new families. Any new construction is for high income families.	The building department, severely underfunded and understaffed, works with the local fire departments and Disaster Planning Department to assure that new construction complies with many aspects of hazard mitigation. Hazards associated with setbacks and floodplain construction are clearly and consistently reviewed when all development plans are considered. And the input of Fire and Disaster agencies are sought where existing policies and ordinances do not provide guidance of a particular issue.
Eden, Town of	Single-family residential development is occurring as part of several small sub-divisions within the Hamlet of Eden. There is also limited single house family residential development scattered throughout the 40 square mile Town of Eden. Annual growth rate is less than 1% a year. Most single-family homes are being built where public water is available within the Hamlet; most development also includes public sewer.	Eden Town ordinance does require the use of detention/ retention ponds where the risk of flooding from heavy rains exists. In some cases, the Town Board has created taxing drainage districts as part of a sub-division development to assure money is put aside for cleaning drainage ditches or correcting problems prohibiting proper drainage.
Elma, Town of	Single family residential development is occurring in previously undeveloped farm and woodlands.	Floodplain town ordinances are applied by the Town of Elma Building Department.
Evans, Town of	Town adopted Local Waterfront Revitalization Program (LWRP) and enforces town zoning law in regards to high-density, high-occupancy development.	Town enforces FEMA regulations for flood hazard areas, and NYSDEC regulations regarding coastal erosion, for all new development. Permitting processes for floodplain areas.
Farnham, Village of	<i>Did not participate</i>	
Gowanda, Village of	The Village of Gowanda has no plans for any housing or residential development at this time.	Yes. Also flood insurance is required for any flood event for FEMA reimbursement in flood identified areas.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4
Summary of Responses, Land Uses and Development Trends Worksheet
(Source: Core Planning Group Members)

Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
Grand Island, Town of	Single family residential development predominantly occurring within existing sanitary sewer districts.	Yes, the Town of Grand Rapids has a Flood Damage Prevention Ordinance that enforces FEMA's regulations.
Hamburg, Town of	Single Family residential development continues in the Southern part of the Town in existing and new subdivisions. In fill residential development of apartments, senior housing and condos is taking place in the central and Northern parts of the Town, and commercial development in existing commercial corridors and areas is slow paced.	The town has adopted local legislation intended for regulation of development and/or certain activities which adversely impact floodplain (Floodplain Damage Prevention, Local Law No. 10-1999)(Coastal Erosion Hazard Area Law, Local Law No.3- 1993). These local laws designate the Town Code Enforcement Dept. to monitor, regulate through permit process and enforcement of any association violation.
Hamburg, Village of	Because of the small area of the village (2.8 square miles) very little development has occurred. We are pretty much close to full build out. Single family residential homes have been built recently on just a few vacant lots within the village limits.	The village does not enforce these ordinances or codes. The Town of Hamburg does this for the Village. We as a village have adopted the Town's floodplain legislation.
Holland, Town of	We were predominately agricultural - now shift towards rural residential including small gentlemen farms (horses), single family homes, & retirement housing.	Yes, we have in place comprehensive zoning, we have a plan and ordinance. Scott Hess - Flood Plan Administrator
Kenmore, Village of	The Village of Kenmore has been "built out" since the 1950's and is currently experiencing a number of redevelopment and infill projects each year. The Village is focused on several objectives listed in its comprehensive land use plan including redevelopment of business districts and the maintenance of its current infrastructure and housing in existing neighborhoods with a recent emphasis on providing more choices for seniors and other independent living options.	The Village does enforce a local zoning ordinance that requires applicants to submit for site plan review and approval from the Building Department. Depending on the site location and scope of the project the Building Department will coordinate the site plan review process with any regional agency that has regulatory over other environmental factors such as wetland protection. The county planning agency also has oversight and recommendation on certain applications that exceed the 239-m or n thresholds for review. In terms of building design, the Village enforces the State Code through a permitting process. It does not have a separate local ordinance for building design.
Lackawanna, City of	At this time the City has a sub-division in progress off Martin Rd. This development is single family residential homes consisting of 21 lots. This development is occurring on presently undeveloped land between South Park Ave. and Abbott Rd. The City is also working with NRP Group on a comprehensive neighborhood revitalization project involving the construction of forty single-family homes and one community building on scattered sites predominantly throughout the First Ward of Lackawanna. An application has been submitted to NYSDHCR for funding.	The City of Lackawanna and all of its Departments promote and enforce compliance with all existing laws, regulations and codes that are related to hazard risk, which include building and fire codes, flood plain regulation and management, Storm Water management and reviews. The City Planning Board reviews all new development in the City and passes along their concerns and recommendations.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4
Summary of Responses, Land Uses and Development Trends Worksheet
(Source: Core Planning Group Members)

Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
Lancaster, Town of	Large residential development, High single family units; Moderate light industrial development; Very light heavy industrial development; Light Senior housing.	Yes, the Town of Lancaster has restricted flood plain development through local and State ordinances. There is a separation of Commercial and Residential Development.
Lancaster, Village of	Transition of once single-family, two story homes to two-family. Increase interest of redeveloping our central business district to critical mass residential, commercial, retail civic centers. Township development has and continues to create storm sewer overflowing into village systems. Township development continues to decrease north/south village streets effectiveness.	The village has established codes and has new development codes along with development standards. Erie County Sewer Authority is presently studying the storm sewer overflow. 1998 Regional Comprehensive Plan not presently being adhered to in certain sections of township.
Marilla, Town of	Slow development of single family residences along existing roads.	Ordinances that prohibit development in the floodplain.
Newstead, Town of	Newstead has seen an increase in development of single family residential housing on previously undeveloped farmland and woodland areas. Approximately 15 units per year over the past few years. There are some small multi-unit residential subdivisions in the planning stage, with construction expected to begin within a few years. Most will be constructed on lands previously used for farming. Limited expansion to existing small light industrial locations.	The Town of Newstead has had a Floodplain protection ordinance in operation since 1988, Chapter 202. All new building plans must be permitted and there is a review process to monitor development in potentially hazardous areas.
North Collins, Town of	Over the past several decades, numerous small family farms were absorbed by just a few large farm operations. While much of the land area is still utilized as farm land, several farms were divided into building lots. This has placed an added burden on emergency services and utilities, and also the water table.	No.
North Collins, Village of	Aging and deteriorating storm sewers along with an increase in runoff from a new athletic field has been the cause of annual flooding for residents on the north end of the village. Empty storefronts and a stagnant village economy are prompting board members to look for assistance in funding mitigation plans.	No.
Orchard Park, Town of	Residential development in the Town of Orchard Park has remained strong, +/- 1,800 building permits have been issued over a 40 year period; the last 10 years several senior apartment buildings and one senior apartment/nursing home facility has been built within the Town in residential areas.	The Town has a flood damage prevention ordinance, first adopted in 1977 and amended in 1982, no damage has occurred in the flood plain in the last 10 years. The Town has also required commercial, industrial and subdivision developments to provide for stormwater control through stormwater design and stormwater detention. The Town and Village adopted storm sewer, Stormwater Management and Erosion and Sediment Control ordinances in 2007 to meet the requirements of the NYSDEC SPDES Stormwater Permit and Stormwater Phase II requirements.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4
Summary of Responses, Land Uses and Development Trends Worksheet
(Source: Core Planning Group Members)

Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
Orchard Park, Village of	There has been very little development in the Village of Orchard Park over the last five years. There is no large developable land in the Village of Orchard Park.	The village has a flood damage prevention ordinance. The Village adopted Storm Sewer, Stormwater Management and Erosion and Sediment Control ordinances in 2008 to meet the requirements of the NYSDEC SPDES Stormwater Permit and Stormwater Phase II requirements.
Sardinia, Town of	None at this time.	Yes - Town Building codes; Ordinance #63-2 protects new development from the effects of flooding. It is enforced by the Building Code Enforcement Officer.
Sloan, Village of	The Village of Sloan is high density residential with little area for development. However, we have recently submitted a USEPA Brownfield Assessment Grant for 13 municipal owned, vacant acreage. Eventual use: commercial and residential development, green space.	The Village's drainage systems ordinance and stormwater management and erosion and sediment control regulations regulate site development. New York State Uniform Fire Prevention and Building Code set forth seismic, wind and snow design requirements.
Springville, Village of	Development in the Village has slowed due to current economic conditions. There have been some minor residential projects (single family homes) and few light commercial and retail projects over the last five years. Further development is expected to remain low as the Village is nearly built out.	Village Code Enforcement Officer reviews and oversees construction projects. The NYS Building Code is used to ensure proper building methods and materials are used. The Village uses ordinances to prohibit building in identified hazard areas. Major projects are also reviewed by the planning board, zoning board, and Industrial Development Agency to ensure positive impact to the community.
Tonawanda, City of	Newly identified redevelopment of former industrial site (46 acres) zoned light industrial/commercial. This site is located in the southwestern area of the City closely surrounded by residential and commercial properties.	Floodplain management. Follow state building and fire codes.
Tonawanda, Town of	The Town of Tonawanda has been 'built out' since the 1950's and is currently experiencing a number of redevelopment and infill projects each year. The Town is focused on several objectives listed in its comprehensive land use plan including redevelopment of Brownfields along the waterfront and the maintenance of its current infrastructure and housing in existing neighborhoods with a recent emphasis on providing more choices for seniors and other independent living options.	The Town enforces a local zoning ordinance that requires applicants to submit for site plan review and approval from the Building Department. Depending on the site location and scope of the project the Building Department will coordinate the site plan review process with the Town's Technical Support Department who administers the local flood hazard mitigation law. They also coordinate with any regional agency that has regulatory authority over other environmental factors such as wetland protection. The county planning agency also has oversight and recommendation on certain applications that exceed the 239-m or n thresholds for review. In terms of building design, the Town enforces the State Code through a permitting process. It does not have a separate local ordinance for building design.

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Table 3d.4 Summary of Responses, Land Uses and Development Trends Worksheet <i>(Source: Core Planning Group Members)</i>		
Community	Land Uses and Development Trends in Hazard Areas	Regulations/Codes/Ordinances To Protect New Development From Various Hazards
<i>Wales, Town of</i>	<i>Did not participate.</i>	
West Seneca, Town of	New residential development is slow due to the economy but "rehab" of existing older residential housing is on the rise.	1) The town enforces the NY State uniform building code, it was adopted by our town in 1962. This addresses wind and snow loads, it also addresses seismic events and the need for specific occupancies to have 'back up' power. 2) Flood Plain Management ordinances in place that does not allow construction in flood plains.
Williamsville, Village of	At this time the Village of Williamsville is seeing moderate development going on throughout the Village but the main concentration is in the commercially zoned areas.	The Village of Williamsville Building Dept. enforces its zoning and the NYS Building Code.

Potential for Future Development

While future development patterns are subject to many regulatory and market-driven factors, it is possible to prepare general estimates of the relative potential for future development to occur in hazard areas by analyzing vacant parcels and their relation to the various hazard areas. As discussed in detail in the Risk Assessment, the planning area is susceptible to certain hazards uniformly. However, the nature of other hazards is such that only delineable portions of the study area are at risk. Using GIS, land use mapping provided by the County was evaluated to estimate the number of vacant and potentially developable parcels in each municipality. Vacant and potentially developable parcels have been assumed to be inclusive of currently unused agricultural lands, forested lands that are not in State ownership or otherwise protected, and barren lands. It was assumed that all of these land uses would be potentially developable in the immediate future, at least to some extent. In this way the analysis is quite conservative, since it does not include currently productive agricultural land, any part of which in the County may face development pressure at some point further in the future.

According to the analysis, it is estimated that there are 127,956 acres of vacant, potentially developable land in the County's 44 jurisdictions – about 21 percent of the County's total land area. **Table 3d.5** lists the estimated acreage of potentially developable vacant parcels in each municipality, and quantifies the acres of vacant land as a percentage of the total acreage of each municipality. Municipalities are encouraged to minimize future development on vacant parcels located in hazard areas, and to impose development restrictions which would offer some form of protection from hazard events.

Municipality	Total Area of Municipality (Acres)	Vacant Land (Acres)	Vacant Land Expressed as Percentage of the Municipality's Total Acreage	Developing Community As Per Framework for Regional Growth?
Akron, Village of	1,228.0	317.7	25.9%	
Alden, Town of	20,394.4	3,279.2	16.1%	
Alden, Village of	1,711.5	674.1	39.4%	
Amherst, Town of	33,488.6	6,635.2	19.8%	Yes
Angola, Village of	869.6	266.1	30.6%	Yes
Aurora, Town of	21,739.4	5,470.1	25.2%	Yes
Blasdell, Village of	635.6	83.7	13.2%	
Boston, Town of	22,926.1	4,537.8	19.8%	Yes
Brant, Town of	14,900.8	3,039.0	20.4%	
Buffalo, City of	26,275.3	3,078.1	11.7%	
Cattaraugus Reservation	16,458.1	0.0	0.0%	
Cheektowaga, Town of	16,292.4	1,797.7	11.0%	
Clarence, Town of	34,321.3	10,435.2	30.4%	Yes
Colden, Town of	22,830.7	6,388.5	28.0%	
Collins, Town of	30,405.8	4,230.7	13.9%	
Concord, Town of	42,641.2	8,915.5	20.9%	
Depew, Village of	3,228.1	427.6	13.2%	
East Aurora, Village of	1,590.2	173.8	10.9%	
Eden, Town of	25,517.9	3,914.6	15.3%	Yes
Elma, Town of	22,116.0	4,339.8	19.6%	Yes

SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

**Table 3d.5
Summary of Vacant Land**

Municipality	Total Area of Municipality (Acres)	Vacant Land (Acres)	Vacant Land Expressed as Percentage of the Municipality's Total Acreage	Developing Community As Per Framework for Regional Growth?
Evans, Town of	25,727.4	7,468.7	29.0%	Yes
Farnham, Village of	652.0	72.7	11.2%	
Gowanda, Village of	359.8	51.3	14.3%	
Grand Island, Town of	18,180.7	5,878.3	32.3%	Yes
Hamburg, Town of	24,224.8	6,219.6	25.7%	
Hamburg, Village of	1,523.6	141.4	9.3%	
Holland, Town of	22,874.0	3,803.7	16.6%	
Kenmore, Village of	916.0	5.2	0.6%	
Lackawanna, City of	4,231.7	381.3	9.0%	
Lancaster, Town of	21,394.0	6,257.1	29.2%	Yes
Lancaster, Village of	1,758.9	212.0	12.1%	
Marilla, Town of	17,546.4	1,469.6	8.4%	
Newstead, Town of	31,404.9	5,221.4	16.6%	Yes
North Collins, Town of	27,008.7	3,427.8	12.7%	
North Collins, Village of	501.9	62.5	12.5%	
Orchard Park, Town of	23,807.9	5,488.6	23.1%	Yes
Orchard Park, Village of	863.2	60.7	7.0%	
Sardinia, Town of	32,214.5	6,182.8	19.2%	
Sloan, Village of	502.5	47.9	9.5%	
Springville, Village of	2,325.0	532.8	22.9%	
Tonawanda, City of	2,378.7	179.4	7.5%	
Tonawanda Reservation	1,158.1	0.0	0.0%	
Tonawanda, Town of	11,172.5	1,087.2	9.7%	
Wales, Town of	22,860.9	4,044.5	17.7%	
West Seneca, Town of	13,742.5	1,638.7	11.9%	
Williamsville, Village of	768.1	16.4	2.1%	
Erie County Total:	669,669.3	127,956.5	19.1%	Yes

Future Development Trends in Hazard Areas

Erie County is striving to achieve new development in a manner that is sustainable and adds to the character, desirability, and quality of its rural areas while minimizing the potential to negatively impact current communities and their transportation systems, infrastructure, open space and parks, and quality of life. It is likely that, in the future, Erie County will continue to balance the pressures of supporting its agricultural communities while fostering the development of new industries. County Planning has indicated that they expect to see future development trends characterized by higher density infill development in the western portions of the County; lower density development in the eastern, rural areas; and moderate density development in the boundary areas between these two zones.

Erie County is cognizant of the risks that it faces due to the impacts of natural hazards. Many municipalities have programs in place today which address certain natural hazards – whether it is a comprehensive or master plan, floodplain management ordinance, or erosion hazard area construction limitations.

Together, Erie County's 44 municipalities have a total of 127,956 acres of vacant, potentially developable land – about 21 percent of the County's total land area. The paragraphs below analyze the likelihood for future development in each of the identified hazards areas to incorporate hazard-resistant design. Overall, while new development is expected to result in an increasing number of structures present in Erie County municipalities, codes and standards in place today will require that they be designed to provide a certain degree of protection from the hazards to which the County and its municipalities are susceptible.

Future Development Trends – Extreme Temperatures Hazard Area

The extreme temperature hazard area covers the whole of Erie County and is essentially uniform for all jurisdictions, therefore future development trends for the extreme temperature hazard area would be the same as those county-wide. If current demographic trends continue, the proportion of the population whose health can be particularly vulnerable to extremes in temperature is likely to increase somewhat in the foreseeable future.

Based on the areas identified as “developing” in the Framework for Regional Growth, it is estimated that development in this hazard area will be more marked in the Village of Angola and the Towns of Amherst, Aurora, Boston, Clarence, Eden, Elma, Evans, Grand Island, Lancaster, Newstead, and Orchard Park.

Future Development Trends – Extreme Wind and Tornado Hazard Areas

The extreme wind hazard area also encompasses the whole of Erie County and is essentially uniform from one jurisdiction to the next. Therefore, future development trends for the wind hazard area would be the same as those county-wide. This would include future development trends for the tornado hazard area, as a tornado is simply one example of a specific type of high wind event. While an increased number of new structures could be exposed in the future, all municipalities must adhere to the New York State Building Code in addition to any local changes that they may have made, so that they will be constructed with a certain degree of protection from the most frequent high wind events.

Based on the areas identified as “developing” in the Framework for Regional Growth, it is estimated that development in this hazard area will be more marked in the Village of Angola and the Towns of Amherst, Aurora, Boston, Clarence, Eden, Elma, Evans, Grand Island, Lancaster, Newstead, and Orchard Park.

Future Development Trends – Winter Storm Hazard Area

The risk of significant snow and ice storms encompasses the entire County and is uniform from one jurisdiction to the next. Therefore, future development trends for the winter storm hazard area would be the same county-wide. It is anticipated that while an increasing number of new structures will be present in the County, they will be constructed at least in accordance with currently adopted building codes which include basic measures to minimize damages caused by winter storms, particularly with regard to snow loading and the protection of utilities.

Based on the areas identified as “developing” in the Framework for Regional Growth, it is estimated that development in this hazard area will be more marked in the Village of Angola and

the Towns of Amherst, Aurora, Boston, Clarence, Eden, Elma, Evans, Grand Island, Lancaster, Newstead, and Orchard Park.

Future Development Trends – Coastal Erosion Hazard Areas

The risk of areas susceptible to coastal erosion encompasses the County's Lake Erie coastal communities. Coastal Erosion Hazard Areas have been mapped by NYSDEC and are regulated in the Towns of Brant, Evans, and Hamburg. The Erie-Niagara Framework for Regional Growth does not identify developing areas in Brant or Hamburg. Evans is identified as a developing community, but not in areas along its Lake Erie Coastline. Based on this information, it would appear that a dramatic increase in exposed property in the coastal erosion hazard area would not be expected. That said, the construction of at least some new structures in the future along the coastline would seem probable; however, they will be built at least in accordance with current regulations regarding NYSDEC mapped CEHAs, thus providing some degree of protection from future damages.

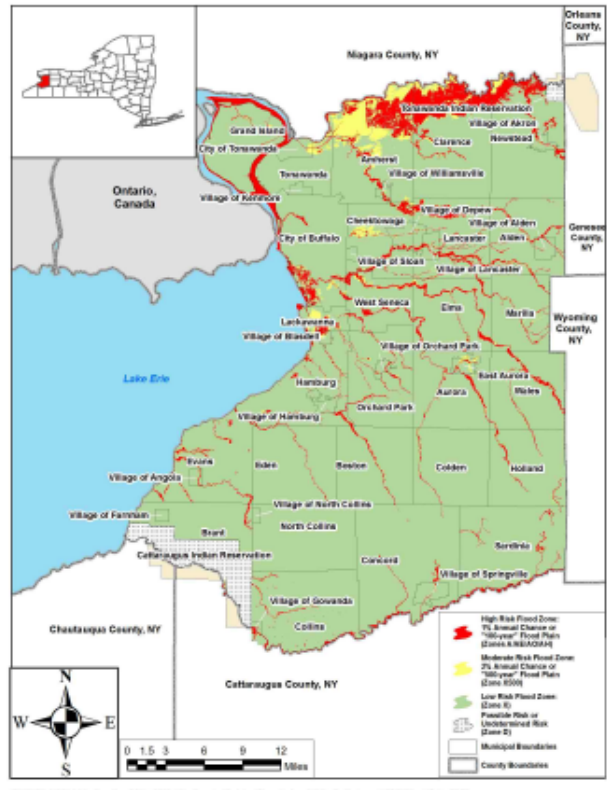
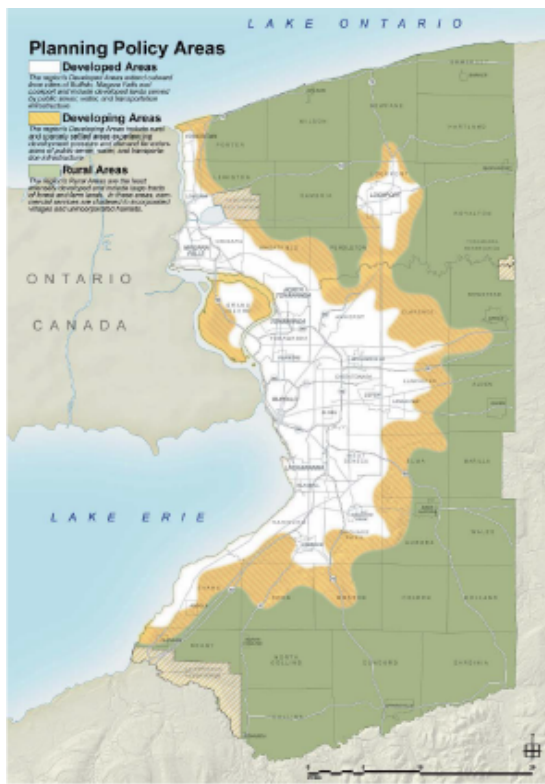
Future Development Trends – Flood Hazard Areas

Individuals and larger developers often look toward land along rivers, streams, canals, bays, and lakes for development because of the passive and active recreational opportunities that they offer. In turn, flood hazard areas are often areas where development pressures are high due to the recreational and aesthetic value of these lands, particularly in communities where the amount of undeveloped land is small and the density of development is high. The creation of additional recreational, entertainment and retail uses along various waterfront areas over time is expected as municipalities are expected to seek to foster the economic success of the County's waterfront communities by promoting increased water-related and water-dependent activities, fostering cooperative planning and promotional activities between waterfront communities, accommodating water-dependent uses with landside impacts, developing waterfront linkages, creating special waterfront zoning techniques for adoption by local municipalities, and assisting in the coordination and implementation of local waterfront revitalization plans.

Development within mapped flood hazard areas is currently regulated for communities participating in FEMA's National Flood Insurance Program (NFIP). All municipalities in the County are recorded as participating in the NFIP at this time except the Town and Village of North Collins. Participating communities must have in place a floodplain management ordinance to regulate activities in the floodplain, as well as a designated floodplain manager/NFIP Coordinator to enforce the relevant ordinances. This will work to protect new development and substantial improvements in the County's floodplains. While it is likely that an increased number of assets could be susceptible to flooding, it is assumed that new structures will be built to codes that will offer a certain degree of protection from the most frequent events.

Based on a comparison of the areas identified as "developing" in the Framework for Regional Growth against FEMA's mapped 100-year floodplain (Zones A and AE), it is possible that development in the flood hazard area could be more marked in the Village of Angola and the Towns of Amherst, Aurora, Boston, Clarence, Eden, Elma, Evans, Grand Island, Lancaster, and Orchard Park (see the following figures and **Table 3d.6**).

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**Table 3d.6
Future Development Trends in Flood Hazard Areas**

Municipality	Total Area of Municipality (Acres)	Land in Flood Hazard Areas (Acres)	Developing Community As Per Framework for Regional Growth?	Potential for Significant Future Development in Flood Hazard Areas
Akron, Village of	1,228.0	101.7		Low
Alden, Town of	20,394.4	946.5		Low
Alden, Village of	1,711.5	89.8		Low
Amherst, Town of	33,488.6	6261.4	Yes	High
Angola, Village of	869.6	60.6	Yes	Moderate
Aurora, Town of	21,739.4	645.1	Yes	Moderate
Blasdell, Village of	635.6	104.0		Low
Boston, Town of	22,926.1	342.2	Yes	Moderate
Brant, Town of	14,900.8	195.6		Low
Buffalo, City of	26,275.3	1,903.8		Low
Cattaraugus Reservation	16,458.1	(Undelineated)		
Cheektowaga, Town of	16,292.4	1,064.3		Low
Clarence, Town of	34,321.3	8341.6	Yes	Moderate
Colden, Town of	22,830.7	193.4		Low
Collins, Town of	30,405.8	740.8		Low
Concord, Town of	42,641.2	852.1		Low
Depew, Village of	3,228.1	274.7		Low
East Aurora, Village of	1,590.2	108.9		Low
Eden, Town of	25,517.9	256.3	Yes	Moderate
Elma, Town of	22,116.0	1,590.4	Yes	Moderate

**Table 3d.6
Future Development Trends in Flood Hazard Areas**

Municipality	Total Area of Municipality (Acres)	Land in Flood Hazard Areas (Acres)	Developing Community As Per Framework for Regional Growth?	Potential for Significant Future Development in Flood Hazard Areas
Evans, Town of	25,727.4	1,291.4	Yes	Moderate
Farnham, Village of	652.0	0.0		Low
Gowanda, Village of	359.8	35.6		Low
Grand Island, Town of	18,180.7	645.5	Yes	Moderate
Hamburg, Town of	24,224.8	1,305.3		Low
Hamburg, Village of	1,523.6	23.2		Low
Holland, Town of	22,874.0	440.0		Low
Kenmore, Village of	916.0	0.0		Low
Lackawanna, City of	4,231.7	693.8		Low
Lancaster, Town of	21,394.0	2,988.9	Yes	Moderate
Lancaster, Village of	1,758.9	174.3		Low
Marilla, Town of	17,546.4	607.9		Low
Newstead, Town of	31,404.9	3,373.2	Yes	Low
North Collins, Town of	27,008.7	0.0		Low
North Collins, Village of	501.9	0.0		Low
Orchard Park, Town of	23,807.9	697.2	Yes	Moderate
Orchard Park, Village of	863.2	71.8		Low
Sardinia, Town of	32,214.5	973.4		Low
Sloan, Village of	502.5	0.0		Low
Springville, Village of	2,325.0	45.3		Low
Tonawanda, City of	2,378.7	91.4		Low
Tonawanda Reservation	1,158.1	(Undelineated)		
Tonawanda, Town of	11,172.5	211.6		Low
Wales, Town of	22,860.9	935.8		Low
West Seneca, Town of	13,742.5	1,484.2		Low
Williamsville, Village of	768.1	85.6		Low
Erie County Total:	669,669.3	40,248.7	Yes	Moderate

Future Development Trends – Ice Jam Hazard Area

While there exists no formal mapping of ice jam hazard areas, due to the unpredictable and localized nature of the hazard, the ice jam hazard is similar to the flood hazard in that ice jams may cause rivers and streams to overflow their banks. If a structure is near the banks of the rivers or streams, it may also be subject to structural damage from the impact of ice striking the structure. Jurisdictional flood hazard ordinances are assumed to currently deal with the flooding aspect of the ice jam hazard, and future damages due to this hazard will depend on development within the floodplain and adherence to the relevant building codes. While an increased number of assets could be susceptible, it is assumed that they will be built to codes that will offer a certain degree of protection from the most frequent events.

Potential for significant development in ice jam hazard areas was evaluated based on a comparison of the areas identified as “developing” in the Framework for Regional Growth, the communities with recorded occurrences of ice jams in the CRREL database, and the estimated potential for significant future development in flood hazard areas (as discussed previously in this plan section).

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LAND USES AND DEVELOPMENT TRENDS

Potential for significant development in ice jam hazard areas was considered to be low unless there was at least one historic occurrence in a community with at least moderate potential for significant future development in flood hazard areas. Under these two assumptions, it is possible that development in areas susceptible to the ice jam hazard could be more marked in the Towns of Elma and Evans.

Table 3d.7 Future Development Trends in Ice Jam Hazard Areas				
Municipality	Developing Community As Per Framework for Regional Growth?	Potential for Significant Future Development in Flood Hazard Areas	Number of Events in Community, As Reported By CRREL	Potential for Significant Development in Ice Jam Hazard Areas
Akron, Village of		Low	0	Low
Alden, Town of		Low	1	Low
Alden, Village of		Low	0	Low
Amherst, Town of	Yes	High	0	Low
Angola, Village of	Yes	Moderate	0	Low
Aurora, Town of	Yes	Moderate	0	Low
Blasdell, Village of		Low	0	Low
Boston, Town of	Yes	Moderate	0	Low
Brant, Town of		Low	0	Low
Buffalo, City of		Low	13	Low
Cheektowaga, Town of		Low	1	Low
Clarence, Town of	Yes	Moderate	0	Low
Colden, Town of		Low	0	Low
Collins, Town of		Low	1	Low
Concord, Town of		Low	0	Low
Depew, Village of		Low	0	Low
East Aurora, Village of		Low	5	Low
Eden, Town of	Yes	Moderate	0	Low
Elma, Town of	Yes	Moderate	2	Moderate
Evans, Town of	Yes	Moderate	4	Moderate
Farnham, Village of		Low	0	Low
Gowanda, Village of		Low	9	Low
Grand Island, Town of	Yes	Moderate	0	Low
Hamburg, Town of		Low	0	Low
Hamburg, Village of		Low	0	Low
Holland, Town of		Low	0	Low
Kenmore, Village of		Low	0	Low
Lackawanna, City of		Low	4	Low
Lancaster, Town of	Yes	Moderate	0	Low
Lancaster, Village of		Low	35	Low
Marilla, Town of		Low	0	Low
Newstead, Town of	Yes	Low	0	Low
North Collins, Town of		Low	0	Low
North Collins, Village of		Low	0	Low
Orchard Park, Town of	Yes	Moderate	0	Low
Orchard Park, Village of		Low	0	Low
Sardinia, Town of		Low	0	Low
Sloan, Village of		Low	0	Low
Springville, Village of		Low	1	Low

Table 3d.7 Future Development Trends in Ice Jam Hazard Areas				
Municipality	Developing Community As Per Framework for Regional Growth?	Potential for Significant Future Development in Flood Hazard Areas	Number of Events in Community, As Reported By CRREL	Potential for Significant Development in Ice Jam Hazard Areas
Tonawanda, City of		Low	6	Low
Tonawanda, Town of		Low	0	Low
Wales, Town of		Low	0	Low
West Seneca, Town of		Low	35	Low
Williamsville, Village of		Low	1	Low
Erie County Total:	Yes	Moderate	118	Low

Future Development Trends – Wave Action Hazard Areas

Areas identified as Velocity Hazard Zones (V/VE Zones on Flood Insurance Rate Maps), in which computed wave heights for the base flood are considered ‘damaging’ (three feet or more), are not mapped on the FEMA DFIRMs. Thus, a specific, delineable wave action hazard area for Lake Erie coastal communities is undefined. The risk of areas susceptible to wave action encompasses the County’s Lake Erie coastal communities (the Cities of Buffalo and Lackawanna, and the Towns of Hamburg, Evans and Brant). The Erie-Niagara Framework for Regional Growth does not identify developing areas in Buffalo, Lackawanna, Hamburg, or Brant. Evans is identified as a developing community, but not in areas along its Lake Erie Coastline. Based on this information, it would appear as if a dramatic increase in exposed property potentially susceptible to significant wave action would not be expected. That said, the construction of at least some new structures in the future along the coastline would seem probable; however, assuming that local floodplain management ordinances would apply in these same areas, they should be built with at least a minimal degree of protection from future damages. It is recommended that, if mapped wave action hazard areas should become available in the future, this section should be updated accordingly and affected communities should consider modifying their floodplain management ordinances to provide construction guidelines for new construction and substantial improvements in a manner that will offer some level of resistance to wave action.

Future Development Trends – Earthquake Hazard Areas

All of Erie County is potentially susceptible to earthquakes. Based on a comparison of the areas identified as “developing” in the Framework for Regional Growth against mapping of the Erie County earthquake hazard as prepared by NYSEMO, it is possible that development in the earthquake hazard area could be more marked in Village of Angola and the Towns of Amherst, Aurora, Boston, Clarence, Eden, Elma, Evans, Grand Island, Lancaster, and Newstead (see the following figures and **Table 3d.8**). This is based on the assumption that communities not identified as ‘developing’ are estimated to have a low potential for significant future development in earthquake hazard areas, and that communities identified as “developing” would have moderate to high potential based on the degree of overlap between the areas noted as developing, and the mapped areas of highest SA values where soil type is expected to amplify the effects of ground motion.

SECTION 3d - RISK ASSESSMENT: LAND USES AND DEVELOPMENT TRENDS

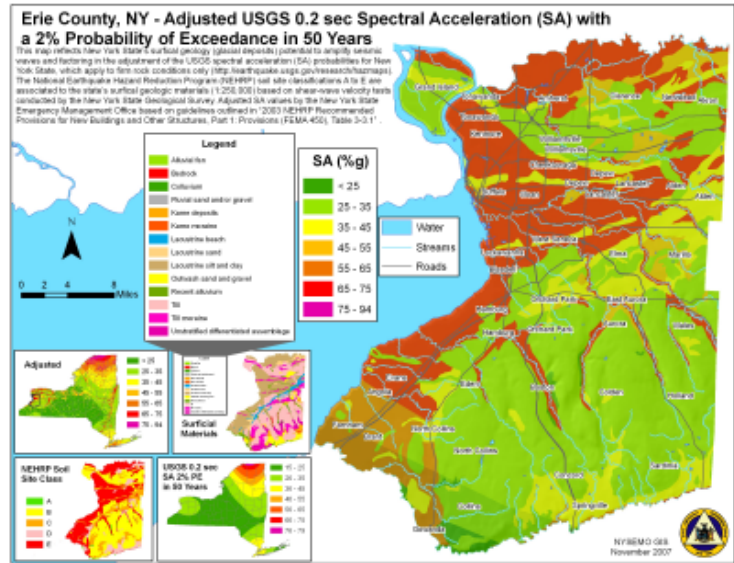
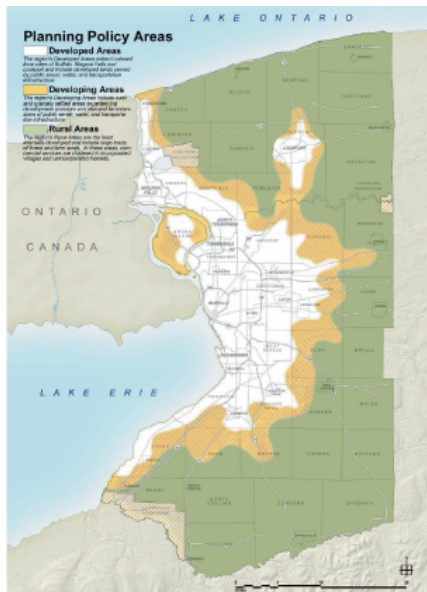


Table 3d.8
Future Development Trends in Earthquake Hazard Areas

Municipality	Developing Community As Per Framework for Regional Growth?	Degree of Correlation Between Mapped Developing Areas and Areas of Highest SA	Potential for Significant Future Development in Earthquake Hazard Areas
Akron, Village of		--	Low
Alden, Town of		--	Low
Alden, Village of		--	Low
Amherst, Town of	Yes	High	High
Angola, Village of	Yes	High	High
Aurora, Town of	Yes	Moderate	Moderate
Blasdell, Village of		--	Low
Boston, Town of	Yes	Moderate	Moderate
Brant, Town of		--	Low
Buffalo, City of		--	Low
Cheektowaga, Town of		--	Low
Clarence, Town of	Yes	Moderate	Moderate
Colden, Town of		--	Low
Collins, Town of		--	Low
Concord, Town of		--	Low
Depew, Village of		--	Low
East Aurora, Village of		--	Low
Eden, Town of	Yes	Moderate	Moderate
Elma, Town of	Yes	Moderate	Moderate
Evans, Town of	Yes	High	High
Farnham, Village of		--	Low
Gowanda, Village of		--	Low
Grand Island, Town of	Yes	Moderate	Moderate
Hamburg, Town of		--	Low
Hamburg, Village of		--	Low

Municipality	Developing Community As Per Framework for Regional Growth?	Degree of Correlation Between Mapped Developing Areas and Areas of Highest SA	Potential for Significant Future Development in Earthquake Hazard Areas
Holland, Town of		--	Low
Kenmore, Village of		--	Low
Lackawanna, City of		--	Low
Lancaster, Town of	Yes	High	High
Lancaster, Village of		--	Low
Marilla, Town of		--	Low
Newstead, Town of	Yes	Moderate	Moderate
North Collins, Town of		--	Low
North Collins, Village of		--	Low
Orchard Park, Town of	Yes	Low	Low
Orchard Park, Village of		--	Low
Sardinia, Town of		--	Low
Sloan, Village of		--	Low
Springville, Village of		--	Low
Tonawanda, City of		--	Low
Tonawanda, Town of		--	Low
Wales, Town of		--	Low
West Seneca, Town of		--	Low
Williamsville, Village of		--	Low
Erie County Total:	Yes	Moderate	Moderate

All communities have adopted the New York State Building Code in addition to any local changes that they may have made. While an increased number of assets could be susceptible in the future, it is assumed that they will be built to codes that will offer a certain degree of protection from the most frequent events.

Future Development Trends – Landslide Hazard Area

Based on a comparison of the areas identified as “developing” in the Framework for Regional Growth against mapping of the Erie County landslide hazard (USGS/NYSGS), it is possible that development in the earthquake hazard area could be more marked in the Towns of Amherst, Boston, Clarence, Eden and Evans (see the following figures and **Table 3d.9**). This is based on the assumption that communities not identified as ‘developing’ are estimated to have a low potential for significant future development in landslide hazard areas, and that communities identified as “developing” would have moderate to high potential based on the degree of overlap between the areas noted as developing, and the mapped areas of highest landslide susceptibility (areas of at least moderate susceptibility or incidence, or historic occurrences).

SECTION 3d - RISK ASSESSMENT: LAND USES AND DEVELOPMENT TRENDS

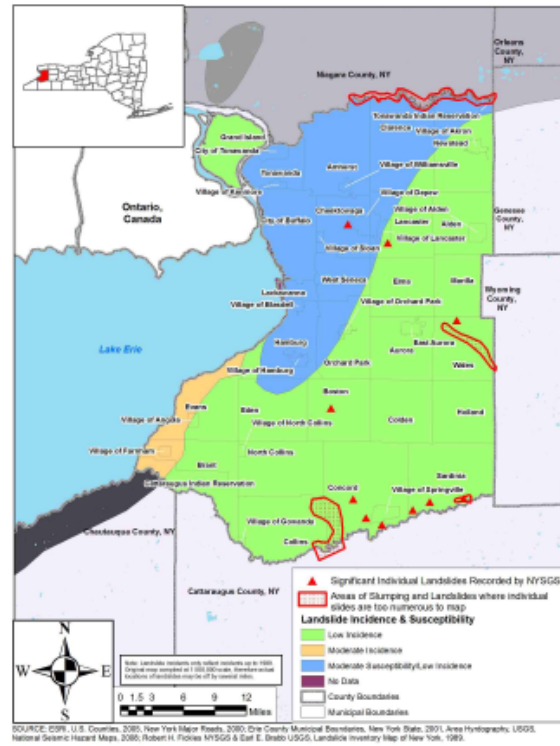
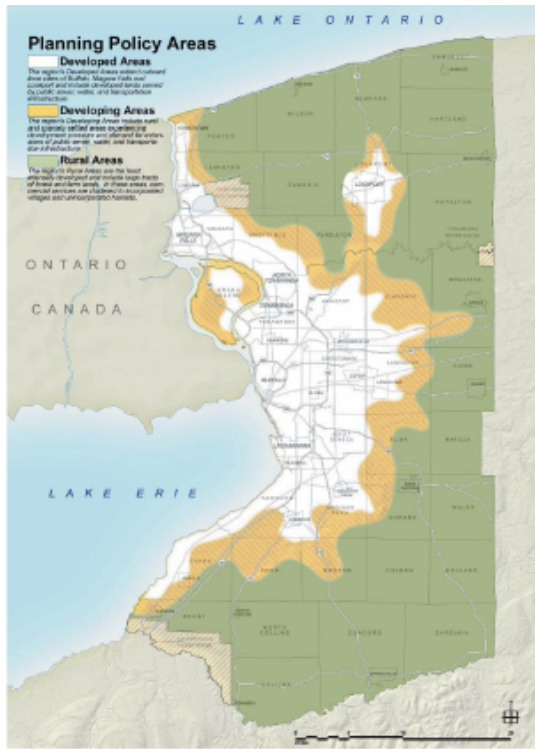


Table 3d.9
Future Development Trends in Landslide Hazard Areas

Municipality	Developing Community As Per Framework for Regional Growth?	Degree of Correlation Between Mapped Developing Areas and Areas of Highest Landslide Susceptibility	Potential for Significant Future Development in Landslide Hazard Areas
Akron, Village of		--	Low
Alden, Town of		--	Low
Alden, Village of		--	Low
Amherst, Town of	Yes	Moderate	Moderate
Angola, Village of	Yes	Low	Low
Aurora, Town of	Yes	Low	Low
Blasdell, Village of		--	Low
Boston, Town of	Yes	Moderate	Moderate
Brant, Town of		--	Low
Buffalo, City of		--	Low
Cheektowaga, Town of		--	Low
Clarence, Town of	Yes	Moderate	Moderate
Colden, Town of		--	Low
Collins, Town of		--	Low
Concord, Town of		--	Low
Depew, Village of		--	Low
East Aurora, Village of		--	Low
Eden, Town of	Yes	Moderate	Moderate
Elma, Town of	Yes	Low	Low

Table 3d.9 Future Development Trends in Landslide Hazard Areas			
Municipality	Developing Community As Per Framework for Regional Growth?	Degree of Correlation Between Mapped Developing Areas and Areas of Highest Landslide Susceptibility	Potential for Significant Future Development in Landslide Hazard Areas
Evans, Town of	Yes	Moderate	Moderate
Farnham, Village of		--	Low
Gowanda, Village of		--	Low
Grand Island, Town of	Yes	Low	Low
Hamburg, Town of		--	Low
Hamburg, Village of		--	Low
Holland, Town of		--	Low
Kenmore, Village of		--	Low
Lackawanna, City of		--	Low
Lancaster, Town of	Yes	Low	Low
Lancaster, Village of		--	Low
Marilla, Town of		--	Low
Newstead, Town of	Yes	Low	Low
North Collins, Town of		--	Low
North Collins, Village of		--	Low
Orchard Park, Town of	Yes	Low	Low
Orchard Park, Village of		--	Low
Sardinia, Town of		--	Low
Sloan, Village of		--	Low
Springville, Village of		--	Low
Tonawanda, City of		--	Low
Tonawanda, Town of		--	Low
Wales, Town of		--	Low
West Seneca, Town of		--	Low
Williamsville, Village of		--	Low
Erie County Total:	Yes	Moderate	Moderate

All communities have adopted the New York State Building Code in addition to any local changes that they may have made. While an increased number of assets could be susceptible, it is assumed that they will be built to codes (such as those regulating development in areas with steep slopes) that will offer a certain degree of protection from the most probable events.

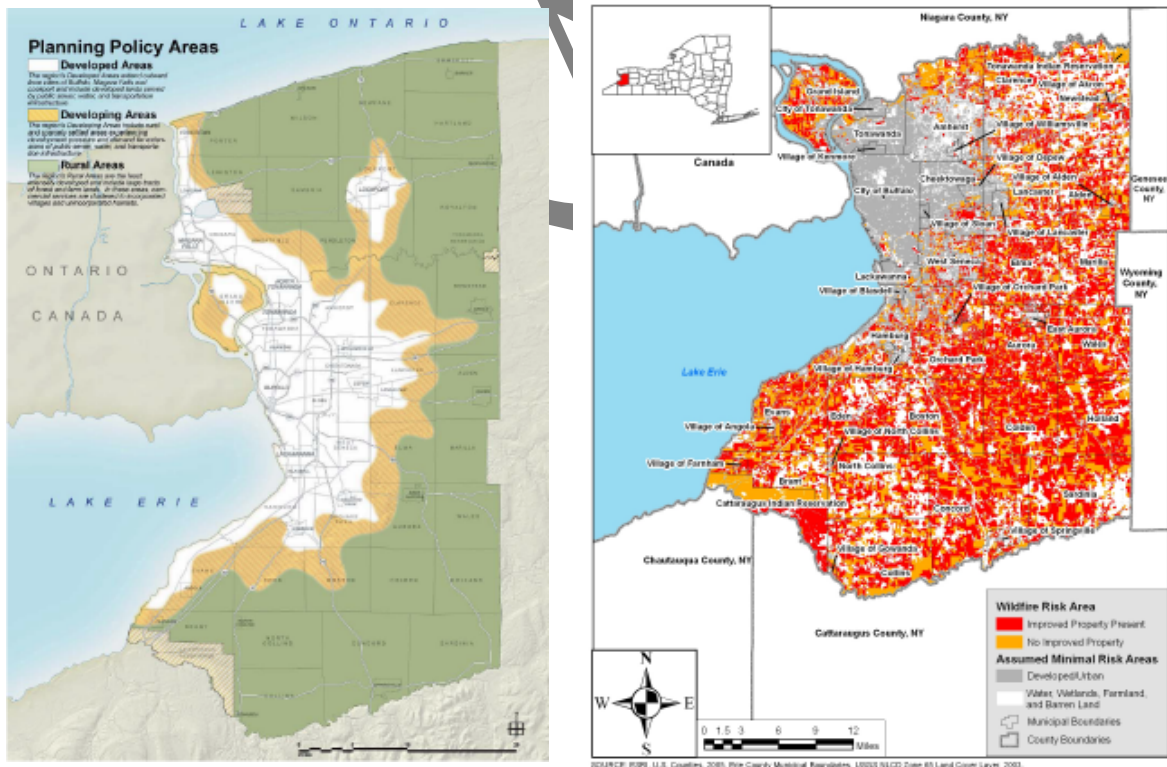
Future Development Trends – Wildfires

Areas that are typically considered to be safe from wildfires include highly urbanized, developed areas that are not contiguous with vast areas of wild lands. Areas typically considered to be prone to wildfires include large tracts of wild lands containing heavier fuels with high continuity such as those forested areas in many parts of the study region. Pressure to develop some forested areas and open land adjacent to forested areas, especially for residential use, will generally result in increases to the wildland-urban interface and the value of improved property within these areas in most jurisdictions, and hence an increased risk of future property damage and public danger due to wildfires.

SECTION 3d - RISK ASSESSMENT: LAND USES AND DEVELOPMENT TRENDS

Based on a comparison of the areas identified as “developing” in the Framework for Regional Growth against mapping of the wildfire hazard severity in Erie County, it is possible that future development in wildfire hazard areas could be more marked in the Village of Angola and the Towns of Amherst, Angola, Aurora, Boston, Clarence, Eden, Elma, Evans, Grand Island, Lancaster, Newstead, and Orchard Park than in other, generally non-developing areas of the county (see the following figures and **Table 3d.10**). This is based on the assumption that communities not identified as ‘developing’ are estimated to have a low potential for significant future development in wildfire hazard areas, and that communities identified as “developing” would have moderate to high potential based on the degree of overlap between the areas noted as developing, and the mapped areas of moderate to high wildfire hazard severity.

All communities have adopted the New York State Building Code in addition to any local changes that they may have made. While an increased number of assets could be susceptible, it is assumed that they will be built to codes that will offer a certain degree of protection from the most probable events.



SECTION 3d - RISK ASSESSMENT:
LAND USES AND DEVELOPMENT TRENDS

Municipality	Developing Community As Per Framework for Regional Growth?	Degree of Correlation Between Mapped Developing Areas and Wildfire Hazard Areas	Potential for Significant Future Development in Wildfire Hazard Areas
Akron, Village of		--	Low
Alden, Town of		--	Low
Alden, Village of		--	Low
Amherst, Town of	Yes	Moderate	Moderate
Angola, Village of	Yes	Moderate	Moderate
Aurora, Town of	Yes	Moderate	Moderate
Blasdell, Village of		--	Low
Boston, Town of	Yes	Moderate	Moderate
Brant, Town of		--	Low
Buffalo, City of		--	Low
Cheektowaga, Town of		--	Low
Clarence, Town of	Yes	Moderate	Moderate
Colden, Town of		--	Low
Collins, Town of		--	Low
Concord, Town of		--	Low
Depew, Village of		--	Low
East Aurora, Village of		--	Low
Eden, Town of	Yes	Moderate	Moderate
Elma, Town of	Yes	Moderate	Moderate
Evans, Town of	Yes	Moderate	Moderate
Farnham, Village of		--	Low
Gowanda, Village of		--	Low
Grand Island, Town of	Yes	Moderate	Moderate
Hamburg, Town of		--	Low
Hamburg, Village of		--	Low
Holland, Town of		--	Low
Kenmore, Village of		--	Low
Lackawanna, City of		--	Low
Lancaster, Town of	Yes	Moderate	Moderate
Lancaster, Village of		--	Low
Marilla, Town of		--	Low
Newstead, Town of	Yes	Moderate	Moderate
North Collins, Town of		--	Low
North Collins, Village of		--	Low
Orchard Park, Town of	Yes	Moderate	Moderate
Orchard Park, Village of		--	Low
Sardinia, Town of		--	Low
Sloan, Village of		--	Low
Springville, Village of		--	Low
Tonawanda, City of		--	Low
Tonawanda, Town of		--	Low
Wales, Town of		--	Low
West Seneca, Town of		--	Low
Williamsville, Village of		--	Low
Erie County Total:	Yes	Moderate	Moderate

SECTION 3E – CONCLUSIONS ON HAZARD RISK**Priority Risk Index**

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its guidance document entitled *Local Mitigation Planning Handbook*. It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts; and carefully considers the findings in other relevant plans, studies and technical reports.

In order to draw some meaningful planning conclusions on hazard risk for Erie County as a whole and each participating jurisdiction, the hazard profiling and risk assessment processes were used to generate hazard classifications according to a “Priority Risk Index” (PRI) - a tool used to measure the degree of risk for identified hazards in a particular planning area. The purpose of the PRI, described further below, is to categorize and prioritize all potential hazards as either high, moderate or low risk. The PRI is used to assist the Erie County Planning Committee in gaining consensus on the determination of those hazards that pose the most significant threat to Erie County based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in Erie County based on standardized criteria. Combined with the asset inventory and quantitative vulnerability assessment provided in the previous sections, the summary hazard classifications generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Erie County jurisdictions to consider as part of their proposed mitigation strategies. Each jurisdiction focused on the identification of mitigation actions that will reduce or eliminate their own unique hazard risks.

The application of the PRI results in numerical values that allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time and duration). Each degree of risk has been assigned a value (1 to 4) and an agreed upon weighting factor¹, as summarized in **Table 3e.1**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below. According to the weighting scheme applied for Erie County, the highest possible PRI value is 4.0.

$$\text{PRI VALUE} = [(\text{PROBABILITY} \times .30) + (\text{IMPACT} \times .30) + (\text{SPATIAL EXTENT} \times .20) + (\text{WARNING TIME} \times .10) + (\text{DURATION} \times .10)]$$

As part of the 2014 Plan Update, the application of the PRI was done for every participating jurisdiction.

¹ The Erie County Planning Committee, based upon any unique concerns or factors for the planning area, may adjust the PRI weighting scheme during future plan updates.

SECTION 3e: RISK ASSESSMENT – CONCLUSIONS ON HAZARD RISK

Table 3e.1 Priority Risk Index for Erie County				
PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	10%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	10%
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

PRI Results

The application of the PRI was done separately for each jurisdiction in Erie County, and for the County as a whole. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Planning Committee and results of the vulnerability assessment. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table 3e.2 summarizes the degree of risk assigned to each category for all identified hazards based on the application of the PRI for Erie County, as a whole.

Table 3e.3 presents an overview of the PRI Results for each jurisdiction.

Detailed tables for each jurisdiction (similar to Table 3e.2) are included in **Appendix O**.

SECTION 3e: RISK ASSESSMENT – CONCLUSIONS ON HAZARD RISK

Table 3e.2
Summary of PRI Results for Erie County

Hazard	Category/Degree of Risk										
	Probability	PROBABILITY INDEX VALUE	Impact	IMPACT INDEX VALUE	Spatial Extent	SPATIAL INDEX VALUE	Warning Time	WARNING INDEX VALUE	Duration	DURATION INDEX VALUE	PRI Score
Atmospheric Hazards											
Extreme Temperatures	Highly Likely	4	Minor	1	Large	4	More than 24 hours	1	Less than one week	3	2.7
Extreme Wind	Highly Likely	4	Limited	2	Large	4	More than 24 hours	1	Less than 24 hours	2	2.9
Tornado	Likely	3	Catastrophic	4	Negligible	1	Less than 6 hours	4	Less than 6 hours	1	2.8
Winter Storm	Highly Likely	4	Limited	2	Large	4	More than 24 hours	1	Less than one week	3	3.0
Hydrologic Hazards											
Coastal Erosion	Highly Likely	4	Minor	1	Negligible	1	More than 24 hours	1	Less than one week	3	2.1
Flood	Highly Likely	4	Critical	3	Moderate	3	6 to 12 hours	3	Less than one week	3	3.3
Ice Jams	Likely	3	Critical	3	Moderate	3	6 to 12 hours	3	Less than one week	3	3.0
Wave Action	Likely	3	Limited	2	Negligible	1	More than 24 hours	1	Less than one week	3	2.1
Geologic Hazards											
Earthquake	Possible	2	Minor	1	Large	4	Less than 6 hours	4	Less than 6 hours	1	2.2
Expansive Soils	0	#N/A									#N/A
Landslide	Possible	2	Catastrophic	4	Negligible	1	Less than 6 hours	4	Less than 6 hours	1	2.5
Other Natural Hazards											
Wildfire	Possible	2	Minor	1	Moderate	3	Less than 6 hours	4	Less than one week	3	2.2

Table 3e.3
PRI Results for Each Jurisdiction²

Jurisdiction	Atmospheric				Hydrologic				Geologic			Wildfire
	Extreme Temperatures	Extreme Wind	Tornado	Winter Storm	Coastal Erosion	Flood	Ice Jams	Wave Action	Earthquake	Expansive Soils	Landslide	
Erie, County of	2.7	2.9	2.8	3.0	2.1	3.3	3.0	2.1	2.2	N/A	2.5	2.2
Akron, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Alden, Town of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	N/A	2.2
Alden, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Amherst, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	2.8	2.5	2.2
Angola, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Aurora, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Blasdell, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Boston, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Brant, Town of	2.7	2.9	2.8	3.0	2.1	3.3	N/A	2.1	2.2	N/A	2.5	2.2
Buffalo, City of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	2.1	2.2	N/A	2.5	2.2
Cheektowaga, Town of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Clarence, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Colden, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Collins, Town of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	N/A	2.2
Concord, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Depew, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
East Aurora, Village of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Eden, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Elma, Town of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Evans, Town of	2.7	2.9	2.8	3.0	2.1	3.3	3.0	2.1	2.2	N/A	2.5	2.2
Farnham, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Gowanda, Village of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	N/A	2.2
Grand Island, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Hamburg, Town of	2.7	2.9	2.8	3.0	2.1	3.3	N/A	2.1	2.2	N/A	2.5	2.2
Hamburg, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Holland, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Kenmore, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Lackawanna, City of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	2.1	2.2	N/A	2.5	2.2
Lancaster, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Lancaster, Village of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Marilla, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	N/A	2.2
Newstead, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
North Collins, Town of	2.7	2.9	2.8	3.0	N/A	N/A	N/A	N/A	2.2	N/A	N/A	2.2
North Collins, Village of	2.7	2.9	2.8	3.0	N/A	3.0	N/A	N/A	2.2	N/A	N/A	2.2
Orchard Park, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Orchard Park, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Sardinia, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Sloan, Village of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Springville, Village of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Tonawanda, City of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Tonawanda, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
Wales, Town of	2.7	2.9	2.8	3.0	N/A	3.3	N/A	N/A	2.2	N/A	2.5	2.2
West Seneca, Town of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2
Williamsville, Village of	2.7	2.9	2.8	3.0	N/A	3.3	3.0	N/A	2.2	N/A	2.5	2.2

² N/A = The hazard was not identified as a significant hazard of concern for the jurisdiction.

Final Determinations

The conclusions drawn from the application of the PRI process for Erie County, including the PRI results and input from the Planning Committee, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk and Low Risk. Hazards with a PRI of 3.0 or more were deemed “high risk”; hazards with a PRI between 2.4 and 2.9 were deemed “moderate risk”; and hazards with a PRI of 2.3 or less were deemed “low risk”. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Erie County. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates³. **Table 3e.4** presents conclusions on hazard risk for the County as a whole, based on the PRI scores for each hazard in the County. **Table 3e.5** presents an overview of the resultant hazard risk rankings for each jurisdiction. Detailed tables for each jurisdiction are included in **Appendix 3e.1**.

Table 3e.4 Hazard Risk Rankings for Erie County	
HIGH RISK PRI ≥ 3.0	Winter Storm Flooding Ice Jams
MODERATE RISK 2.4 ≤ PRI ≤ 2.9	Extreme Temperatures Extreme Wind Tornado Landslide
LOW RISK PRI ≤ 2.3	Coastal Erosion Wave Action Earthquake Wildfire

³ Overall conclusions on hazard risk were re-evaluated as part of the first plan update for every participating jurisdiction.

**Table 3e.5
Hazard Risk Rankings for Each Jurisdiction⁵**

Jurisdiction	Atmospheric				Hydrologic				Geologic			Wildfire
	Extreme Temperatures	Extreme Wind	Tornado	Winter Storm	Coastal Erosion	Flood	Ice Jams	Wave Action	Earthquake	Expansive Soils	Landslide	
Erie, County of	M	M	M	H	L	H	H	L	L	N/A	M	L
Akron, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Alden, Town of	M	M	M	H	N/A	H	H	N/A	L	N/A	N/A	L
Alden, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Amherst, Town of	M	M	M	H	N/A	H	N/A	N/A	L	M	M	L
Angola, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Aurora, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Blasdell, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Boston, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Brant, Town of	M	M	M	H	L	H	N/A	L	L	N/A	M	L
Buffalo, City of	M	M	M	H	N/A	H	H	L	L	N/A	M	L
Cheektowaga, Town of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Clarence, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Colden, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Collins, Town of	M	M	M	H	N/A	H	H	N/A	L	N/A	N/A	L
Concord, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Depew, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
East Aurora, Village of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Eden, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Elma, Town of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Evans, Town of	M	M	M	H	L	H	H	L	L	N/A	M	L
Farnham, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Gowanda, Village of	M	M	M	H	N/A	H	H	N/A	L	N/A	N/A	L
Grand Island, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Hamburg, Town of	M	M	M	H	L	H	N/A	L	L	N/A	M	L
Hamburg, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Holland, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Kenmore, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Lackawanna, City of	M	M	M	H	N/A	H	H	L	L	N/A	M	L
Lancaster, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Lancaster, Village of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Marilla, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Newstead, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
North Collins, Town of	M	M	M	H	N/A	N/A	N/A	N/A	L	N/A	N/A	L
North Collins, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	N/A	L
Orchard Park, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Orchard Park, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Sardinia, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Sloan, Village of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Springville, Village of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Tonawanda, City of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Tonawanda, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
Wales, Town of	M	M	M	H	N/A	H	N/A	N/A	L	N/A	M	L
West Seneca, Town of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L
Williamsville, Village of	M	M	M	H	N/A	H	H	N/A	L	N/A	M	L

⁵ N/A = The hazard was not identified as a significant hazard of concern for the jurisdiction.

Key Risk Findings

Key Risk Findings are problem statements developed from the risk assessment by each participating jurisdiction. Each jurisdiction was encouraged to consider different types of mitigation actions for addressing their highest hazards and Key Risk Findings.

Key Risk Findings for Erie County are presented in **Table 3e.6**. Key Risk Findings for each particular jurisdiction are included in **Appendix 3e.1**.

Table 3e.6 Key Risk Findings for Erie County
Roads and culverts in various locations county-wide are in need of mitigation to reduce flooding.
Debris in creeks and streams at various locations county-wide contributes to and exacerbates flooding.
Training is needed to improve county response to severe summer storms, flooding, tornadoes, winter driving, extreme weather events, winter storms, and all natural hazards.
Tree removal and trimming along various County roads is needed to prevent power outages and road closures during natural hazard events including severe storms, tornadoes, winter storms, high winds, and ice storms.
Inadequate storm drainage systems along various County roads contributes to flooding.

SECTION 4 - CAPABILITIES AND RESOURCES

This capability assessment examines the ability of the Erie County participating jurisdictions to implement and manage a comprehensive mitigation strategy, which includes a range of mitigation actions. The strengths, weaknesses, and resources of participating jurisdictions are identified in this assessment as a means to develop an effective hazard mitigation program. Furthermore, the capabilities identified in this assessment are evaluated collectively to develop recommendations, which support the implementation of effective mitigation actions throughout the County.

URS provided FEMA worksheets to ECDES in September 2011 for distribution to the municipal representatives in order to initiate this capability assessment. The worksheets requested information pertaining to existing plans, policies, and regulations that contribute to or hinder the ability to implement hazard mitigation actions. They also requested information pertaining to the legal and regulatory capability, technical and administrative capacity, and fiscal capability of each jurisdiction. Twenty-four towns, 14 villages and three cities returned completed worksheets illustrating their capability to implement a hazard mitigation strategy.

This section describes the activities currently underway, which contribute to or can be utilized for hazard mitigation. Additional information is provided to emphasize the technical and financial resources available at the State and Federal levels, which the communities in the County can access to effectively implement a hazard mitigation program.

Capabilities and Resources – Erie County Jurisdictions

Legal and Regulatory Capability

As indicated in **Table 4.1**, the Erie County jurisdictions have each reported several policies, programs, and capabilities which help to prevent and minimize future damages resulting from hazards. These tools are valuable instruments in pre and post disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework. These policies, programs, and capabilities are described in greater detail for the participating jurisdictions, as well as the State and Federal levels.

Table 4.1
Jurisdictional Legal and Regulatory Capabilities*

Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance	Special Purposes Ordinance	Growth Management Ordinance	Site Plan Review Requirements	Comprehensive/Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Response Plan	Post-Disaster Recovery Plan	Post-Disaster Recovery Ordinance	Real Estate Disclosure Ordinance	Local Waterfront Revitalization Plan
Erie, County of	✓				✓	✓	✓	✓	✓	✓	✓			
Akron, Village of	✓	✓	✓	✓		✓	✓	✓		✓				
Alden, Town of	✓	✓	✓	✓		✓	✓	✓	✓	✓			U	
Alden, Village of	✓	✓	✓	✓		✓	✓	✓	✓	✓			U	
Amherst, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Angola, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Aurora, Town of	✓	✓	✓	✓			✓	✓		✓	✓		✓	

Table 4.1
Jurisdictional Legal and Regulatory Capabilities*

Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance	Special Purposes Ordinance	Growth Management Ordinance	Site Plan Review Requirements	Comprehensive/Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Response Plan	Post-Disaster Recovery Plan	Post-Disaster Recovery Ordinance	Real Estate Disclosure Ordinance	Local Waterfront Revitalization Plan
Blasdell, Village of	✓	✓		✓		✓	✓	✓		✓	✓			
Boston, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Brant, Town of	✓	✓				✓	✓			✓	✓			✓
Buffalo, City of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Cheektowaga, Town of	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			
Clarence, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Colden, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Collins, Town of	✓	✓	✓	✓		✓	✓	✓	✓	✓				
Concord, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Depew, Village of	✓	✓	✓	✓		✓	✓			✓	✓		✓	
East Aurora, Village of	✓	✓	✓	✓		✓	✓	✓		✓	✓		✓	
Eden, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Elma, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Evans, Town of	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Farnham, Village of	Did not participate and did not provide feedback													
Gowanda, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Grand Island, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
Hamburg, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hamburg, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Holland, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Kenmore, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Lackawanna, City of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Lancaster, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Lancaster, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Marilla, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Newstead, Town of	✓	✓	✓	✓		✓	✓	✓		✓				
North Collins, Town of	✓	✓	✓	✓		✓	✓			✓				
North Collins, Village of	✓	✓	✓			✓	✓			✓				
Orchard Park, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Orchard Park, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Sardinia, Town of	✓	✓	✓	✓	✓	✓	✓			✓			✓	
Sloan, Village of	✓	✓		✓		✓	✓			✓	✓			
Springville, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Tonawanda, City of	✓	✓	✓	✓		✓	✓	✓		✓				✓
Tonawanda, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Wales, Town of	Did not participate and did not provide feedback													
West Seneca, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Williamsville, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

*U= Unknown

Building Code

Building codes regulate construction standards and are developed for specific geographic areas of the country. They consider the type, frequency, and intensity of hazards present in the region. Structures built to applicable building codes are inherently resistant to many hazards such as strong winds, floods, and

earthquakes. Due to the location specific nature of the building codes, these are very valuable tools for mitigation.

As per Title 19 (NYCRR) Chapter XXXII Part 1202.1, *"In general, local governments are charged with the administration and enforcement of the New York State Uniform Fire Prevention and Building Code (Uniform Code). However, a local government has the option to decline that responsibility by adopting a local law to that effect, in which event the responsibility passes to the respective county. Counties are accorded a similar option. If a local government and a county each exercises its option, the statute provides for administration and enforcement of the Uniform Code by the Secretary of State in the place and stead of the local government. Certain other events may also result in administration and enforcement of the Uniform Code by the Secretary of State."*

In Erie County, administration and enforcement of the New York State Uniform Fire Prevention and Building Code (Uniform Code) is required in all municipalities.

All of the participating communities in Erie County reported regulation of construction through the use of a building code.

Zoning Ordinance

Zoning is a useful tool to consider when developing a mitigation strategy. It can be used to restrict new development, require low-density development, and designate specific uses (i.e., recreational) in the hazard prone areas. Private property rights must be considered, but enacting a zoning ordinance can reduce or potentially eliminate damages from future hazard events.

All of the participating jurisdictions in Erie County have reported their adoption of a zoning ordinance.

Subdivision Ordinance

Subdivision ordinances offer an opportunity to account for natural hazards prior to the development of land as they formulate regulations when the land is subdivided. Subdivision design that incorporates mitigation principles can reduce the exposure of future development to hazard events.

All participating jurisdictions in Erie County with the exception of the Village of Blasdell, Town of Brant, and Village of Sloan have reported their adoption of subdivision ordinances.

Special Purpose Ordinance

A special purpose ordinance is a form of zoning in which specific standards dependent upon the special purpose or use must be met. For example, many special purpose ordinances include basic development requirements such as setbacks and elevations. The special purpose ordinance is a useful mitigation technique particularly when implemented to reduce damages associated with flooding and coastal erosion. The only special purpose ordinance identified by any of the jurisdictions was their floodplain ordinances.

In Erie County, all of the participating jurisdictions recorded that they have adopted special purpose ordinances, with the exception of the Town of Brant, Village of Gowanda, and Village of North Collins.

Growth Management Ordinance

Growth management ordinances are enacted as a means to control the location, amount, and type of development in accordance with the larger planning goals of the jurisdiction. These ordinances often

designate the areas in which certain types of development is limited and encourage the protection of open space for reason such as environmental protection and limitation of sprawl.

The Towns of Amherst, Boston, Clarence, Colden, Concord, Eden, Elma, Evans, Grand Island, Hamburg, Holland, Lancaster, Marilla, Orchard Park, Sardinia, Tonawanda, and West Seneca; the Villages of Angola, Gowanda, Hamburg, Lancaster, Orchard Park, Springville and Williamsville; and the Cities of Buffalo and Lackawanna have reported that they have adopted growth management ordinances.

Site Plan Review Requirements

Site plan review requirements are used to evaluate proposed development prior to construction. An illustration of the proposed work, including its location, exact dimensions, existing and proposed buildings, and many other elements are often included in the site plan review requirements. The site plan reviews offer an opportunity to incorporate mitigation principles, such as ensuring that the proposed development is not in an identified hazard area and that appropriate setbacks are included.

All of the jurisdictions have reported that they have adopted site plan review requirements with the exception of the Town of Aurora and the Village of East Aurora.

Comprehensive Plan

A comprehensive plan is a document which illustrates the overall vision and goals of a community. It serves as a guide for the community's future and often includes anticipated demographics, land use, transportation, and actions to achieve desired goals. Integrating mitigation concepts and policies into a comprehensive plan provides a means for implementing initiatives through legal frameworks and enhances the opportunity to reduce the risk posed by hazard events.

All of the participating communities have each reported that they have a Comprehensive Plan or Master Plan in place.

Capital Improvement Plan

Capital Improvement Plans schedule the capital spending and investments necessary for public improvements such as schools, roads, libraries, and fire services. These plans can serve as an important mechanism to reduce growth in identified hazard areas through limited public spending and can be used as a to develop a match for mitigation projects.

All of the participating jurisdictions except the Town of Brant, Village of Depew, Town of Elma, Village of Gowanda, Town of North Collins, Village of North Collins, Town of Sardinia, and Village of Sloan have reported that they have a Capital Improvement Plan.

Economic Development Plan

Economic Development Plans offer a comprehensive overview of the local or regional economic state, establish policies to guide economic growth, and include strategies, projects, and initiatives to improve the economy in the future.

Furthermore, economic development plans, similar to capital improvement plans, offer an opportunity to reduce development in hazard prone areas by encouraging economic growth in areas less susceptible to hazard events.

The Towns of Alden, Amherst, Boston, Cheektowaga, Clarence, Colden, Concord, Eden, Evans, Grand Island, Hamburg, Holland, Lancaster, Marilla, Orchard Park, Tonawanda, West Seneca; the Villages of

Alden, Angola, Hamburg, Lancaster, Orchard Park, Springville, and Williamsville; and the Cities of Lackawanna and Buffalo have reported that they have an economic development plan.

Emergency Response Plan

Emergency response plans provide an opportunity for local governments to anticipate an emergency and plan the response accordingly. In the event of an emergency, a previously established emergency response plan can improve response and reduce negative effects as the responsibilities and means by which resources are deployed has been previously determined.

All of the participating communities have reported that they have adopted emergency response plans.

Post-Disaster Recovery Plan

A post-disaster recovery plan guides the physical, social, environmental, and economic recovery and reconstruction procedures after a disaster. Hazard mitigation principles are often incorporated into post-disaster recovery plans in order to reduce repetitive disaster losses.

The Towns of Amherst, Aurora, Brant, Cheektowaga, Colden, Concord, Eden, Hamburg, Holland, Marilla, Orchard Park, and West Seneca; the Villages of Angola, Blasdell, East Aurora, Gowanda, Hamburg, Lancaster, Orchard Park, Springville, and Williamsville; and the Cities of Lackawanna and Buffalo have recorded that they have developed post-disaster recovery plans.

Post-Disaster Recovery Ordinance

Post-disaster recovery ordinances are often produced in conjunction with post-disaster recovery plans. The ordinances are enacted after a hazard event to guide redevelopment in order to reduce future damages and mitigate repetitive loss.

Only the Towns of Colden, Evans, Hamburg, Holland, and Marilla; the Villages of Hamburg and Lancaster; and the City of Buffalo have recorded that they have adopted a post-disaster recovery ordinance.

Real Estate Disclosure Ordinance

A real estate disclosure ordinance requires individuals selling real estate to inform potential buyers of the hazards to which the property and/or structure is vulnerable prior to the sale. Such a requirement ensures that the new property owner is aware of the hazards to which the property is at risk of damage.

Only the Towns of Aurora, Boston, Colden, Evans, Hamburg, Holland, Marilla, Sardinia and Tonawanda; and the Villages of Angola, Depew, East Aurora, Hamburg, and Kenmore; and the City of Buffalo have recorded that they have adopted a real estate disclosure ordinance. The Town and Village of Alden each reported that they were unsure.

Local Waterfront Revitalization Plan

Local Waterfront Revitalization Plans (LWRPs) are comprehensive land and water use plans which LWRP serve to coordinate local and State actions needed to achieve a community's goals for its waterfront. LWRPs contain many components and address issues such as coastal erosion management and waterfront development. The revitalization policies and strategies outlined in a LWRP may not place people or property at undue risk to a hazard event. Seven of Erie County's communities have LWRPs in place: the Towns of Brant, Evans, Grand Island, Hamburg, and Tonawanda; and the Cities of Lackawanna and Tonawanda.

Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is contingent upon its staff and resources. Administrative capability is determined by evaluating whether there are an adequate number of personnel to complete mitigation activities. Similarly, technical capability can be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in surveying and Geographic Information Systems.

Table 4.2 provides a summary of the administrative and technical capabilities currently in place, as reported by each participating jurisdiction. The checkmark (✓) indicates that the local government has documented that it maintains a staff member or has access to the services of an appropriate person for the given function.

It should be noted that several villages noted shared service agreements with their respective towns to provide various services/staff.

Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and management practices	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planner(s) or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager *	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or HAZUS	Scientists familiar with the hazards of the community	Emergency Manager	Grant writers
Erie, County of	✓	✓	✓		✓	✓	✓		✓	✓
Akron, Village of	✓	✓	✓	✓		✓	✓	✓	✓	
Alden, Town of	✓	✓	✓	✓		✓			✓	✓
Alden, Village of	✓	✓	✓	✓		✓			✓	✓
Amherst, Town of	✓		✓	✓	✓	✓	✓		✓	✓
Angola, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aurora, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Blasdell, Village of	✓	✓	✓	✓		✓	✓		✓	✓
Boston, Town of	✓	✓	✓	✓	✓		✓		✓	✓
Brant, Town of	✓	✓	✓	✓			✓			✓
Buffalo, City of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cheektowaga, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clarence, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colden, Town of	✓	✓	✓	✓	✓	✓	✓		✓	✓
Collins, Town of	✓	✓	✓	✓	✓	✓	✓		✓	
Concord, Town of	✓	✓	✓	✓	✓	✓			✓	✓
Depew, Village of	✓	✓	✓	✓		✓	✓		✓	
East Aurora, Village of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Eden, Town of	✓	✓	✓	✓	✓	✓	✓		✓	✓
Elma, Town of	✓	✓	✓	✓		✓	✓		✓	✓
Evans, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Farnham, Village of</i>	<i>Did not participate</i>									
Gowanda, Village of	✓	✓	✓	✓		✓		✓	✓	
Grand Island, Town of	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hamburg, Town of	✓	✓	✓	✓		✓	✓			✓
Hamburg, Village of				✓		✓	✓			
Holland, Town of		✓		✓		✓			✓	
Kenmore, Village of	✓	✓	✓	✓	✓	✓	✓		✓	✓

Table 4.2
Jurisdictional Administrative and Technical Capabilities

Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and management practices	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planner(s) or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager *	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or HAZUS	Scientists familiar with the hazards of the community	Emergency Manager	Grant writers
Lackawanna, City of	√	√	√	√	√	√	√		√	√
Lancaster, Town of	√	√	√	√	√	√			√	√
Lancaster, Village of	√	√	√	√	√	√	√	√	√	√
Marilla, Town of	√	√		√					√	√
Newstead, Town of	√	√	√	√		√	√	√	√	√
North Collins, Town of		√							√	
North Collins, Village of										√
Orchard Park, Town of	√	√	√	√	√	√	√		√	√
Orchard Park, Village of	√	√	√	√	√	√			√	
Sardinia, Town of				√		√	√		√	√
Sloan, Village of	√	√	√	√		√		√	√	
Springville, Village of	√	√	√	√	√	√			√	√
Tonawanda, City of	√	√		√		√			√	√
Tonawanda, Town of	√	√	√	√	√	√	√		√	√
Wales, Town of				Did not participate						
West Seneca, Town of	√	√	√	√		√			√	√
Williamsville, Village of		√		√		√			√	

*All communities except the Town and Village of North Collins participate in the National Flood Insurance Program.

Fiscal Capability

The ability of a local government to implement mitigation activities is also associated with the funding available for policies and projects. Funding for such initiatives is often locally based revenue and financing, as well as outside grants. Costs associated with mitigation activities range from staffing and administrative costs to the actual cost of the mitigation project.

Table 4.3 provides a summary of the fiscal capabilities currently in place, as reported by each participating jurisdiction. The checkmark (√) indicates that the financial resource was reported to be available in the local jurisdiction for mitigation purposes. The letter 'U' indicates that the respondent was unsure whether the jurisdiction has access to or is eligible for the following financial resources for hazard mitigation.

Table 4.3
Jurisdictional Fiscal Capabilities

Jurisdiction	Community Development Block Grants (CDBG)	Capital Improvements Project Funding	Authority to Levy Taxes for Specific Purposes	Fees for Water, Sewer, Gas, or Electric Service	Impact Fees for Homebuyers or Developers for New Developments/Homes	Incur Debt through General Obligation Funds	Incur Debt through Special Tax and Revenue Bonds	Incur Debt through Private Activity Bonds	Withhold Spending in Hazard-Prone Areas	Other
Erie, County of	√	√	√	√		√	√	U	U	
Akron, Village of	√	√	√	√	√	√	√		√	
Alden, Town of	√	√	√			√	U	U	U	
Alden, Village of	√	√	√	√		√	√	U	U	
Amherst, Town of	√	√	√			√	√			
Angola, Village of	U	U	U	U	U	U	U	U	U	
Aurora, Town of	√	√	√	√	U	√	√	U		
Blasdell, Village of	√	√	√			√			√	
Boston, Town of	√	√	√	√	U	√	U			
Brant, Town of	√	√	√			√	√			
Buffalo, City of	√	√	√	√	√	√	√	√	√	
Cheektowaga, Town of	√	√	√	√		√	√		√	
Clarence, Town of	√	√	√			√	√			
Colden, Town of	√	√	√	√		√	√	U	U	
Collins, Town of	√	√	√	√		√	√	U	U	
Concord, Town of	√	√	√	√	U	√				
Depew, Village of	√	√	√	√	√	√	√		√	
East Aurora, Village of	√	√	√	√	U	√	√	U		
Eden, Town of	√	√	√	√		√	√			
Elma, Town of	√	U	U	√	√	U	U	U	U	
Evans, Town of	√	√	√	√	√	√	√		√	√
<i>Farnham, Village of</i>	<i>Did not participate</i>									
Gowanda, Village of	√	√	√	√	U		√		U	
Grand Island, Town of	√	√	√	√	√	√	√	√	U	U
Hamburg, Town of		√							√	√
Hamburg, Village of		√							√	
Holland, Town of	√	√	√	√	√	√	√	U	√	
Kenmore, Village of	√	√	√	√	√	√	√	U	U	
Lackawanna, City of	√	√	√		√	√	√		√	
Lancaster, Town of	√	√			U	√	√	U	U	
Lancaster, Village of	√	√	√	√	√	√	√			
Marilla, Town of	√		√			√	√	√		
Newstead, Town of	√	√	√	√	√	√	√		√	
North Collins, Town of										
North Collins, Village of			√	√		√	√	√		
Orchard Park, Town of	√	√	√		√	√				
Orchard Park, Village of	√	√	√	√	√	√				
Sardinia, Town of	√		√			√	√		√	
Sloan, Village of	√		√			√	√			
Springville, Village of	√	√	√	√	U	√				
Tonawanda, City of	√	√	√	√	U	√	U	U		
Tonawanda, Town of	√	√	√	√	√	√	√	U	U	
<i>Wales, Town of</i>	<i>Did not participate</i>									
West Seneca, Town of	√	U	√	√	√	√	√			U
Williamsville, Village of	√	√	√	√		√	√			

*U = Unsure

The Town of Newstead and the Village of Akron noted that “pre-hazard mitigation grant programs and funding for small community-based projects” were other sources of financial resources.

It should be noted that a number of the communities answered that they did not know whether they had one or more of the financial capabilities available to them. It is recommended that these capabilities should be researched further during the plan maintenance phase, so that the communities may make use of a full-range of capabilities.

Conclusion

This capability assessment finds that most of the Erie County participating jurisdictions collectively have legal, technical, and fiscal tools and resources necessary to implement hazard mitigation strategies. Jurisdictions were asked to review local plans and ordinances and consider all local capabilities when developing their mitigation strategies as the enhancement of existing capabilities, or bridging identified gaps in capabilities, can further mitigation goals and objectives.

Capabilities and Resources – State of New York

The State of New York, through the New York State Consolidated Laws, Executive Law Article 2-B entitled “*State and Local: Natural and Man-Made Disaster Preparedness*” established the Disaster Preparedness Commission (DPC) to examine all aspects of natural and human induced disasters. While the law emphasized local authority and responsibility in the development and maintenance of plans and programs for natural and human induced disaster mitigation, DPC is tasked to examine all aspects of disaster prevention, response, and recovery, as well as prepare the state disaster preparedness plans.

The DPC consists of commissioners, directors, and chairs of State agencies and the American Red Cross. State agencies such as the New York State Office of Emergency Management (OEM), the Department of State (DOS), the Department of Environmental Conservation (DEC), and the Department of Transportation (DOT) are participants in the DPC. The DPC, with the support of the Mitigation Section of the OEM, developed the New York State Multi-Hazard Mitigation Plan. The State Plan was not only designed to fulfill the requirements of the Disaster Mitigation Act of 2000, but was also created to serve as a resource for local governments in the development of local hazard mitigation plans.

The State’s Plan includes an evaluation of the State’s pre and post hazard mitigation policies, programs, and capabilities; the policies related to development in hazard prone areas; and the State’s funding capabilities. The Erie County Multi-Jurisdictional Hazard Mitigation Plan incorporates many of the resources identified in the State Plan to demonstrate the capabilities present for local jurisdictions to consider in the development of local hazard mitigation. Many of these capabilities are described in further detail in this portion of the assessment.

New York State Office of Emergency Management (OEM)

In addition to facilitating the development of the New York State Multi-Hazard Mitigation Plan, OEM offers a variety of assistance to local governments in the preparation and implementation of mitigation activities. For example, the OEM Mitigation and Planning Sections coordinated to develop the “Empire Plan,” a comprehensive emergency management plan which addresses the aspects of emergency management: readiness, mitigation, response, and recovery. OEM developed the “Empire Plan” as a model for local governments to use in the creation of local comprehensive emergency management plans. In addition to the “Empire Plan” OEM also offers direct funding support and technical assistance for the preparation of all-hazards mitigation plans for those communities to which funding for such assistance is not available. Beyond these activities, OEM also coordinates with agencies such as the New York Department of State and the Department of Environmental Conservation to provide resources for hazard mitigation.

New York State Department of State (DOS)

DOS offers local governments many forms of assistance for preparing, implementing, and sustaining mitigation activities. The DOS Division of Coastal Resources, for example, provides local governments with technical assistance in the completion of Local Waterfront Revitalization Plans (LWRP). These plans are comprehensive land and water use plans which contain many components and address issues such as coastal erosion management and waterfront development. Upon completion of the LWRP, the plan is reviewed by the OEM Mitigation Section to ensure that the policies and strategies outlined do not place people or property at undue risk to a hazard event. Approximately sixty-six local jurisdictions in the State have approved LWRPs. Seven of these are in Erie County (the Towns of Brant, Evans, Grand Island, Hamburg, and Tonawanda; and the Cities of Lackawanna and Tonawanda).

New York State Department of Environmental Conservation (DEC)

The DEC directs many programs and forms of assistance useful to local governments developing mitigation strategies.

DEC provides technical assistance to local governments through the Floodplain Management Program and the Flood Protection Bureau. The Floodplain Management Program provides assistance to local governments adopting and administering local floodplain management ordinances. Similarly, the Flood Protection Bureau provides technical assistance in eligibility requirements for the National Flood Insurance Program in order to qualify local governments for entrance into the program. Each of these forms of assistance aids local governments in the development and implementation of flood mitigation activities to eliminate or reduce future flood damages.

Further technical assistance in floodplain management is provided through “Community Assistance Visits” administered by the DEC in collaboration with the OEM. These two agencies partner in this effort to provide technical assistance on floodplain management program development. The Visits are prioritized by an assessment of needs conducted by the DEC and the OEM. In addition to the “Community Assistance Visits,” these agencies also coordinate to provide assistance for flood mitigation planning and sponsor technical assistance workshops for local governments interested in developing flood mitigation programs.

New York State Department of Transportation (DOT)

The Department of Transportation incorporates mitigation techniques into routine design, construction, and maintenance procedures throughout the State and also engages in mitigation projects, technical assistance activities, and training. For example, DOT provides guidance to local communities developing plans for the long-term re-routing of traffic due to a disaster. Furthermore, DOT engages in mitigation projects such as the elevation of roads in flood prone areas, cleaning of ditches and streams, management of stormwater erosion, tree pruning, and bi-annual inspection of bridges. DOT also develops and conducts training sessions on heavy snow removal and snow plowing for highway maintenance supervisors and equipment operators.

State Resources

This capability assessment finds that the State of New York’s various departments collectively have a significant level of legal, technical, and fiscal tools and resources necessary to implement hazard mitigation strategies.

Capabilities and Resources – Federal

The Federal government offers a wide range of funding and technical assistance programs to help make communities more disaster resistant and sustainable. Many of these are included in **Table 4.4**, the Federal Technical Assistance and Funding matrix. Programs associated with the construction or reconstruction of housing and businesses, public infrastructure (transportation, utilities, water, and sewer), and supporting overall hazard mitigation and community planning objectives are emphasized in the matrix. Some programs are disaster-specific, activated by a Presidential Disaster Declaration under the provisions of the Stafford Act. Also included are programs or grants that are not specifically disaster related.

Federal Resources

FEMA has developed a large number of documents that address implementing hazard mitigation at the local level. Key resource documents are briefly described below.

Local Mitigation Plan Review Guide (October 2011) and Planning Handbook (March 2013). These two documents define the technical requirements for hazard mitigation plans and updates, and present various ways that plan can be developed to meet these requirements. The *Guide* represents FEMA's interpretation of a statutory or regulatory requirement and is intended to help State and Federal officials review and approve local hazard mitigation plans. The *Handbook* is a companion to the *Guide* and is a tool for local governments developing plans, offering practical approaches and examples for how communities can engage in effective planning to reduce long-term risk from natural hazards and disasters.

How-to Guides. Some communities in Erie County have chosen not to participate in the planning process at this time, but could participate during future updates of the plan. Those communities can find additional information about the hazard mitigation planning process on the FEMA web site. FEMA has developed a series of nine “how-to guides” to assist States, communities, and tribes in enhancing their hazard mitigation planning capabilities. The first four guides mirror the four major phases of hazard mitigation planning used in the development of the Erie County Multi-jurisdictional Hazard Mitigation Plan. The last five how-to guides address special topics that arise in hazard mitigation planning such as using benefit-cost analysis and integrating man-made hazards. The use of worksheets, checklists, and tables make these guides a practical source of guidance to address all stages of the hazard mitigation planning process. They also include special tips on meeting DMA 2000 requirements.

Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments. FEMA, DAP-12, September 1990. This handbook explains the basic concepts of hazard mitigation, and shows State and local governments how they can develop and achieve mitigation goals within the context of FEMA's post-disaster hazard mitigation planning requirements. The handbook focuses on approaches to mitigation, with an emphasis on multi-objective planning.

Mitigation Resources for Success CD. FEMA 372, September 2001. This CD contains a wealth of information about mitigation and is useful for State and local government planners and other stakeholders in the mitigation process. It provides mitigation case studies, success stories, information about Federal mitigation programs, suggestions for mitigation measures to homes and businesses, appropriate relevant mitigation publications, and contact information.

A Guide to Federal Aid in Disasters. FEMA 262, April 1995. When disasters exceed the capabilities of State and local governments, the President's disaster assistance program (administered by FEMA) is the primary source of Federal assistance. This handbook discusses the procedures and process for obtaining this assistance, and provides a brief overview of each program.

The Emergency Management Guide for Business and Industry. FEMA 141, October 1993. This guide provides a step-by-step approach to emergency management planning, response, and recovery. It also details a planning process that companies can follow to better prepare for a wide range of hazards and emergency events. This effort can enhance a company's ability to recover from financial losses, loss of market share, damages to equipment, and product or business interruptions. This guide could be of great assistance to Jefferson County industries and businesses located in hazard prone areas.

2011 Hazard Mitigation Assistance Unified Guidance. June 1, 2010. This guide provides information regarding applying for each of FEMA's hazard mitigation grant programs including the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation Program (PDM), the Flood Mitigation Assistance Program (FMA), the Repetitive Flood Claims Program (RSC) and the Severe Repetitive Loss Program (SRL). This guidance is updated annually and can be found on FEMA's web site at: <http://www.fema.gov/library/viewRecord.do?id=4225>

Important Websites

The following are important websites that provide focused access to valuable planning resources for communities interested in sustainable development initiatives.

- <http://www.fema.gov> - Web site of the Federal Emergency Management Agency includes links to information, resources, and grants that communities can use in planning and implementation of sustainable measures.
- <http://www.planning.org> – Web site of the American Planning Association, a non-profit professional association that serves as a resource for planners, elected officials, and citizens concerned with planning and growth initiatives.
- <http://www.ibhs.org> – Web site of the Institute for Business and Home Safety, an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters. Online resources provide information on natural hazards, community land use, and ways you can protect your property from damage.

Federal Technical Assistance and Funding

The Federal government offers a wide range of funding and technical assistance programs that communities can access to assist in their long-term recovery. Some of these programs are geared to disaster preparedness and mitigation planning, while the focus of others is the long-term vitality of the communities. To assist communities in their rebuilding efforts and to better prepare for the future, the information in **Table 4.4** is divided under the headings of conservation and environment, economic development, emergency management, historic preservation, housing, infrastructure, and mitigation. It should be noted that the inclusion of this document in the Plan is for informational purposes. The Federal Programs requirements or grants may change from time-to-time and it is recommended that the communities refer to the web site listed below. Ultimately, it will be the communities' decision on the type of grants to use in protecting and improving their communities.

For further information on these and other Federal programs, see the Catalog of Federal Domestic Assistance (CFDA) available on online at <http://www.cfda.gov/>.

Table 4.4
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
CONSERVATION & ENVIRONMENT								
DOC; NOAA	Habitat Conservation	Cooperative grants to support a wide variety of research, habitat restoration, construction, management and public education activities for marine and estuarine habitats.	To benefit US fisheries, conserve protected resources, and add to the economic and social well being of the nation.	Local governments, universities and colleges, Indian Tribes, private profit and non-profit research and conservation organizations and individuals.	State coordinating official.	Submit application through Grants.gov. Proposals are evaluated for technical merit, soundness of design, competency of applicant to perform the proposed work, potential contribution of the project to national goals and appropriateness and reasonableness of costs.	90 days prior to the start date of the project.	Regional or local office. http://www.nmfs.noaa.gov/regional.htm
DOC; NOAA; Marine Fisheries Service	Unallied Management Costs	Cooperative grants to support management activities for high priority marine and estuarine resources.	To provide economic, sociological, public policy and other information needed by administrators for conserving and managing fishery resources and protected species in their environment.	Local governments, universities and colleges, Indian Tribes, private profit and non-profit research organizations and individuals.	State coordinating official.	Submit application through Grants.gov. Proposals are evaluated for technical merit, soundness of design, competency of applicant to perform the proposed work, potential contribution of the project to national goals and appropriateness and reasonableness of costs.	90 days prior to the start date of the project.	Southeast Federal Program Officer http://www.nmfs.noaa.gov/regional.htm (727) 824-5304.
DOD; USACE	Beach Erosion Control Projects	Specialized services to design and construct projects under a cost share method.	To protect beach and shore erosion through projects not specifically authorized by Congress.	Political subdivisions of the state and other responsible local agencies.	Consult with the nearest District Engineer.	Formal letter to District Engineer. Approval is subject to the availability of funds.	None.	Corps of Engineers District Office. http://www.usace.army.mil/howdoi/where.html
DOI; FWS	Conservation Grants Private Stewardship for Imperiled Species	Grants to fund voluntary restoration management, or enhancement of habitat on private lands for endangered, threatened, proposed, candidate or other at risk species.	To provide Federal financial and other assistance to individuals and groups engaged in local, private and voluntary conservation efforts to be carried out on private lands that benefit species listed or proposed as endangered or threatened.	Sponsored organization, individuals / families, specialized groups, public non-profit institutions/ organizations, private non-profit institutions/ organizations, small business, profit organizations and other private institutions/	See www.grants.gov or http://endangered.fws.gov/grants/private_stewardship/index.html	See www.grants.gov or http://endangered.fws.gov/grants/private_stewardship/index.html	See www.grants.gov or http://endangered.fws.gov/grants/private_stewardship/index.html	Regional or local office. http://endangered.fws.gov/grants/private_stewardship/index.html

Table 4.4
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
CONSERVATION & ENVIRONMENT								
DOI; FWS	North American Wetland Conservation Fund	Grants to acquire real property interest in lands and water, including water rights, and to restore, manage, and/or enhance wetland ecosystems and other habitats for migratory birds, and other fish and wildlife.	To provide grant funds for wetland conservation projects.	Public or private organizations or to individuals who have developed partnerships to carry out wetland conservation projects.	Grants.gov	Submit applications.	March and July of each year.	Regional or local office. http://www.fws.gov/birdhabitat/Grants/NAWCA/CouncilAct.shtm
DOI; National Park Service	Save America's Treasures	Project Grants to protect and preserve nationally significant historical sites and wall as nationally significant collections of intellectual and cultural artifacts.	To provide matching grants for preservation and/or conservation work on nationally significant intellectual and cultural artifacts and nationally significant historical structures and sites.	Intrastate, interstate, local agencies, public or private non-profit institutions/organizations, public or private colleges and universities, including state colleges and universities and federally recognized Indian tribes.	Contact Save American Treasures at http://www.cr.nps.gov/hps/treasures/ (202) 513-7270, ext. 6.	Contact Save American Treasures at http://www.cr.nps.gov/hps/treasures/ (202) 513-7270, ext. 6.	Contact Save American Treasures at http://www.cr.nps.gov/hps/treasures/ (202) 513-7270, ext. 6.	Contact Save American Treasures at http://www.cr.nps.gov/hps/treasures/ or (202) 513-7270, ext. 6.
EPA; Office of Brownfields Cleanup and Redevelopment, Office of Solid Waste and Emergency Response	Brownfields Assessment and Cleanup Cooperative Agreements.	A revolving loan fund and project grants to provide funding to inventory, characterize, assess and conduct planning and community involvement related to Brownfield sites; to capitalize a revolving loan fund and provide sub-grants to carry out cleanup activities at	To assist in the expansion, redevelopment, or reuse of sites complicated by the presence of a hazardous substance, pollutant, or contaminant.	A general purpose unit of local government, a land clearance authority or a quasi-government entity acting under the authority of the local government, a regional council or a group of general purpose units of government, a	EPA Regional Office. http://www.epa.gov/epahome/locate2.htm	Competitive grant program. See Grant Announcement available from EPA.	Contact Regional Office. http://www.epa.gov/epahome/locate2.htm	Brownfields Regional Office Coordinator, Dallas, Texas (214) 665-6737. http://www.epa.gov/epahome/locate2.htm

Table 4.4
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
CONSERVATION & ENVIRONMENT								
		the sites; and, to carry out cleanup activities on land owned by the grant recipient.		redevelopment agency, Indian Tribes, and non-profit organizations (subject to conditions).				
EPA, Office of Water	Regional Wetland Program Development Grants	Project Grants to encourage wetland program development by promoting the coordination and acceleration of research, investigations, experiments, training, demonstration, survey and studies related to the causes, effects, extent, prevention, reduction and elimination of water pollution.	To assist State, Tribal, local government agencies and interstate/intertribal entities to build capacity to protect, manage and restore wetlands.	Tribes, local governments, interstate agencies and intertribal consortia.	EPA Regional Office.	EPA Regional Office will review grant application and any grants will be awarded by the regional Administrator.	Contact EPA Regional Office. http://www.epa.gov/epahome/locate2.htm	EPA Regional Office, Wetland Coordinator. http://www.epa.gov/epahome/locate2.htm
USDA; Forest Service	Forest Land Enhancement Program	Project Grants for technical assistance to develop management plans, educational programs and assistance to increase awareness, and cost-share assistance to implement sustainable forestry practices on the ground.	Sustainable management of non-industrial private forests and other rural land suitable for sustainable forest management.	State Forestry Agencies and Landowners, managers of non-industrial private forests lands, nonprofit organization, consultant foresters, universities, other state, local and private organization and agencies.	State Forestry Agency. http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml	The State must prepare a State Priority Plan that is approved by the Forest Service. After Approval a property owner is eligible for cost share assistance.	Deadlines are determined by State Forestry Agencies. http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml	Regional or local office of US Forest Service. http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml
USDA;	Urban and	Project grants for	To plan for, establish,	State Forestry,	Contact Regional	Contact Regional Offices.	Contact Regional Offices.	Regional or local office of

Table 4.4
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
CONSERVATION & ENVIRONMENT								
Forest Service	Community Forestry Program	assistance in urban forestry programs.	manage and protect trees, forests, green spaces and related resources in and adjacent to cities and towns.	interested members of the public, private nonprofit organizations in urban and community forestry programs in cities and communities.	Offices.		http://www.fs.fed.us/ucf/	US Forest Service. http://www.fs.fed.us/ucf/

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Table 4-4b
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
DOC; EDA	Economic Adjustment Assistance	Project Grants to help local interests design and implement strategies to adjust or bring about changes in the economy.	Aids the long-range economic development of areas with severe unemployment, and low family income problems, aids in the development of public facilities and private enterprises to create new, permanent jobs.	Economic Development Districts, cities or other political subdivisions of the state or a consortium of political subdivisions, Indian tribes or a consortium of Indian tribes, institutions of higher learning or a consortium of such institutions, or public or non-profit organizations or association acting in cooperation with the political subdivisions.	Meet with EDA's Economic Development Representative (EDR) to determine whether the preparation of a project proposal is appropriate.	After meeting with EDR the Regional Director will decide whether to invite an application. More information will be given at that time.	Continuing basis.	Regional or Local Office. http://www.eda.gov/Contacts/Contacts.xml
DOC; EDA	Economic Development Support for Planning Organizations	Project grants to establish economic development strategies designed to reduce unemployment and increase incomes.	To strengthen economic development planning capacity.	Economic Development Districts, Indian Tribes, units of local government, institutions of higher education and private non-profit organizations.	Submit a letter of interest, a statement of distress and a proposed work program not to exceed 10 pages and SF 424 to regional or Local Office.	Following invitation by agency a formal application is made to the regional office and to the EDA state representative.	None.	Regional or Local Office. http://www.eda.gov/Contacts/Contacts.xml
DOD; Office of Economic Adjustment	Growth Management Planning Assistance	To provide project grants to assist local governments to undertake community economic adjustment planning activities.	Planning in response to the establishment or expansion of Department of Defense military Installation.	Local governments or regional organizations.	http://www.oea.gov	Application is reviewed and approved by the Department of Defense's Office of Economic Adjustment.	None.	Regional or Local Office. http://www.eda.gov/Contacts/Contacts.xml

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Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
DOL	Disaster Unemployment Assistance	Direct Payments for Specified Use; Provision of Specialized Services.	Disaster Unemployment Assistance provides financial assistance to individuals whose employment or self-employment has been lost or interrupted as a direct result of a major disaster declared by the President of the United States. Before an individual can be determined eligible for Disaster Unemployment Assistance, it must be established that the individual is <u>not</u> eligible for regular unemployment insurance benefits (under any state or federal law). The program is administered by states as agents of the federal government.	In order to qualify for this benefit your employment or self-employment must have been lost or interrupted as a direct result of a major disaster and you must have been determined not eligible for regular state unemployment insurance. With exceptions for persons with an injury and for self-employed individuals performing activities to return to self-employment, individuals must be able to work and available for work, which are the same requirements to be eligible for state unemployment insurance benefits.	An applicant should consult the office or officials designated as the single point of contact in his or her State for more information on the process the State requires to be followed in applying for assistance, if the State has selected the program for review.	Claims should be filed in accordance with the state's instructions published in announcements about the availability of Disaster Unemployment Assistance, or contact the State Unemployment Insurance agency.	Applications for DUA must be filed within 30 days after the date of the SWA announcement regarding availability of DUA. When applicants have good cause, they may file claims after the 30-day deadline. However, no initial application will be considered if filed after the 26th week following the declaration date.	More information about this program and where to apply for benefits under this program is available at: http://workforcesecurity.dol.gov/unemploy/disaster.asp To determine your eligibility for unemployment insurance (UI) benefits, you should contact the state unemployment insurance agency in the state where you are located as soon as possible after becoming unemployed. In some states, you can now file a claim by telephone and the Internet.
EDA	Economic Development and Adjustment Program, Sudden and Severe Economic Dislocation	Grants	To help States and localities to develop and/or implement strategies that address adjustment problems resulting from sudden and severe economic dislocation.	States, Localities, Non-Profit Organizations, and Indian Tribes.	Information regarding EDA's program procedures, regulations, and other requirements are available at EDA's website, www.eda.gov	Project grants can be funded in response to natural disasters including improvements and reconstruction of public facilities.	Contact the Disaster Recovery Coordinator, Economic Adjustment Division.	Disaster Recovery Coordinator, Economic Adjustment Division, EDA, DOC, Herbert C. Hoover Building, Washington, DC 20230. Telephone: 800.345.1222 or

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Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
	(Title IX)							202.482.6225. http://www.doc.gov/eda/html/prgtile.htm
FHWA; Maritime Administration	Development and Promotion of Ports and Intermodal Transportation	Advisory Services and Counseling, Technical Information.	Promote and plan for the development and utilization of domestic waterways, ports and port facilities.	Local government Agencies, Metropolitan Planning Organizations, Public Port and Intermodal Authorities, Trade Associations and Private Intermodal and Terminal Operators.	Regional or Local Office.	Personal Conference or Explanation of Problem.	None.	Regional or Local Office. http://www.marad.dot.gov/welcome/regional%20off_dir ectory.html
HUD; Community Planning and Development	Community Development Block Grants / Brownfields Economic Development Initiative	Project Grants to carry out economic development projects on contaminated building s or land.	To return Brownfields to productive economic use.	Units of local government.	Application Procedures will be published in Notice of Funding Availability in the Federal Register.	The Process will be published in Notice of Funding Availability in the Federal Register.	Deadline will be published in Notice of Funding Availability in the Federal Register.	Regional or local Office. http://www.hud.gov/offices/cpd/economicdevelopment/programs/bedi/index.cfm
HUD; Office of Community Planning and Development	Community Development Block Grants Section 108 Loan Guarantees	Guaranteed/Insured Loans for financing of economic development, housing rehabilitation, public facilities, and large scale physical development projects.	To provide communities with a source of financing for economic development, housing rehabilitation, public facilities, and large scale physical development projects.	Metropolitan Cities and Urban Counties.	See 24 Code of Federal regulations, Section 570.704 for application requirements.	See 24 Code of Federal regulations, Section 570.704 for application process.	Continuing basis.	Regional or Local Office. http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/index.cfm
HUD; Office of Community Planning and Development	Community Development Block Grants / Technical Assistance Program	Project Grants (Cooperative Agreements) to transfer skills and knowledge of planning, developing and administering CDBG programs to eligible block grant entities.	To help units of local government, Indian tribes and area wide planning organizations to plan, develop and administer local CDBG programs.	Units of local government, national or regional non-profit organizations that have membership comprised predominantly of entities or officials of entities of	In answer to competitions and solicitations. They will be detailed in the Federal Register.	Applicants will be notified of acceptance or rejections.	Deadlines are in solicitation documents.	Regional or Local Office. http://www.hud.gov/offices/cpd/communitydevelopment/programs/index.cfm

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Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
				CDBG recipients, professional and technical service companies, public or private non-profit organizations including educational institutions and area-wide planning organizations.				
HUD; Policy Development and Research	Hispanic-Serving Institutions Assisting Communities	Project Grants for neighborhood revitalization, housing and economic development projects.	To assist Hispanic serving institutions of higher education to expand their role and effectiveness in addressing community development needs in their localities, consistent with the purposes of Title 1 of the housing and Community Development Act of 1974.	Nonprofit accredited Hispanic serving institutions of higher education that are on the US Dept. of Education's list of eligible HSI's or certify that they meet the statutory definition of an HIS.	Application Procedures will be published in Notice of Funding Availability in the Federal Register.	The Process will be published in Notice of Funding Availability in the Federal Register.	Deadline will be published in Notice of Funding Availability in the Federal Register.	HUD Office of University Partnerships http://www.oup.org/ (202) 708-3061.
HUD; Policy Development and Research	Historically Black Colleges and Universities Program	Project Grants for those activities that are eligible for CDBG funds as listed in 24 Code of Federal regulations, part 570, subpart C, particularly paragraphs 570.201 through 570.206.	To assist historically black colleges and universities to expand their role and effectiveness in addressing community development needs in their localities, including neighborhood revitalization, housing, and economic development, principally for persons of low-moderate income.	Historically Black Colleges and Universities as determined by the U.S. Dept. of Education.	Application Procedures will be published in Notice of Funding Availability in the Federal Register.	The Process will be published in Notice of Funding Availability in the Federal Register.	Deadline will be published in Notice of Funding Availability in the Federal Register.	HUD Office of University Partnerships http://www.oup.org/ (202) 708-3061.
USDA;	Assistance to	Project Grants and	Assistance to rural	Political	Application	Grants Awarded on a Competitive	Deadline will be published in	DOA Electric Program

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Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
Rural Utilities Service	High Energy Cost Rural Communities	Direct loans use to acquire construct, extend, upgrade and improve energy generation, transmission, or distribution facilities in rural communities where the average expenditure on home energy cost is at least 275% of the national average.	communities with extremely high energy costs.	subdivisions of states, for-profit and non-profit businesses, cooperatives, association, organization, and other entities organized under the laws of States, Indian tribes, tribal entities, and individuals.	Procedures will be published in Notice of Funding Availability in the Federal Register.	Basis.	Notice of Funding Availability in the Federal Register.	http://www.usda.gov/rus/eletric/regs/fedreg.htm (202) 720-9545.
USDA; Rural Business-Cooperative Service	Business and Industry Loans	Direct Loans and Guaranteed/Insured Loans. Direct Loans for modernization, development cost, purchasing and developing land, easements, rights-of-way, buildings, facilities, leases or materials, purchasing equipment, leasehold improvements, machinery and supplies, and pollution control and abatement equipment. Guaranteed Loans are for the same actions mentioned above plus for agricultural production, when not eligible for the Farm Service Agency farmer	To assist public, private and cooperative organizations, Indian Tribes or individuals in rural areas to obtain quality loans for the purpose of improving, developing or financing business, industry, and employment and improving the economic and environmental climate in rural communities including pollution abatement controls.	A cooperative, corporation, partnership, trust or other legal entity organized and operated on a profit or nonprofit basis, an Indian tribe, a municipality, county or other subdivision of state or individuals in rural areas.	Rural Development State Office	Contact the Rural Development State Office or the State Coordinating Agency. http://www.rurdev.usda.gov/recd_map.html	Not Applicable.	Rural Development State Office. http://www.rurdev.usda.gov/recd_map.html

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Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
		program assistance and when it is part of an integrated business also involved in the processing of agricultural products.						
USDA; Rural Utilities Service	Community Connect Grant Program	Project grants for the deployment of broadband transmission services to critical community facilities, rural residents and rural businesses and for the construction, acquisition, expansion, and/or operation of a community center which would provide such services free to residents for at least 2 years.	To encourage community oriented connectivity in rural areas where such service does not currently exist.	Indian Tribe or tribal organization, local units of government or other legal entity, including cooperatives or private corporations of limited liability companies organized on a for profit or nonprofit basis, and have the legal authority to own and operate the broadband facilities as proposed in its application, to enter into contracts and to comply with federal statutes and regulations.	Application in accordance with 7 Code of Federal regulations, Section 1739.	Grants Awarded on a Competitive Basis.	Deadline will be published in Notice of Funding Availability in the Federal Register.	DOA Telecommunications Program http://www.usda.gov/rus/telcom/index.htm (202) 720-9554.
USDA; Rural Housing Service	Community Facilities Loans and Grants	Guaranteed/Insured Loans, Direct Loans or Project Grants for community facilities such as child care facilities, food recovery and distribution centers,	To construct, enlarge, extend or otherwise improve community facilities providing essential service to rural residents.	City and County agencies, political and quasi-political subdivisions of the state, associations including corporations, Indian tribes and	Obtain SF-424 from the rural Development Area Office for a pre-application.	The pre-application is reviewed by the Rural Development area office and state office and the applicant is advised whether to file an application.	None.	Regional or local office. http://www.rurdev.usda.gov/rd/pubs/pa1557.htm

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Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
		assisted living facilities, group homes, mental health clinics, shelters and education facilities. Projects comprise community, social, cultural, transportation, industrial park sites, fire and rescue services, access ways, and utility extensions. All facilities must be for public use.		existing private corporations which are operated on a not-for-profit basis, have or will have the authority necessary for constructing operating and maintaining the proposed facility or service and for obtaining, giving security for and repaying the loans, and are unable to finance the project from its own resources or through commercial credit at a reasonable rate.				
USDA; Cooperative State Research, Education, and Extension Service	Community Food Projects	Project grants a comprehensive approach to develop long term solutions to help ensure food security in communities by linking the food sector community development, economic opportunity, and environmental enhancement (50/50 program).	To support the development of community food projects designed to meet the food needs of low income people; increase the self-reliance of communities in providing their own needs; and promote comprehensive responses to local food, farm, and nutrition issues.	Private nonprofit entities.	Application Procedures will be published in Notice of Funding Availability in the Federal Register.	The Process will be published in Notice of Funding Availability in the Federal Register.	Deadline will be published in Proposal Solicitation in the Federal Register.	DOA Competitive Research Grants and Awards Management (202) 401-1761.
USDA	Livestock Assistance Program	Direct Payments.	To provide direct payments to eligible livestock producers who suffered grazing losses	Citizens of, or legal resident alien in the United States; a farm		Applicants visit the county or parish Farm Service Agency (FSA) office in the eligible county or parish to make application, certify eligibility and report	Sign-up for assistance under the 2000 LAP began January 18, 2000. Date for ending the sign-up will be determined at	Regional or Local Office: Consult the local phone directory for location of the nearest county FSA office.

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Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
			due to drought, hot weather, disease, insect infestation, fire, hurricane, flood, fire, earthquake, severe storm, or other disasters during the 2000 crop year. Benefits will be provided to eligible livestock producers only in those counties where a severe natural disaster occurred. A county must have been approved as a primary disaster area under a Secretarial disaster designation or Presidential disaster declaration after January 1, 2000, and subsequently approved for participation in the Livestock Assistance Program (LAP) by the Deputy Administrator for Farm Programs.	cooperative, private domestic corporation, partnership, or joint operation in which a majority interest is held by the members, stockholders, or partners who are citizens of, or legal resident alien of the United States; Indian tribe or tribal organization of the Indian Self-Determination and Education Assistance Act; any organization under the Indian Reorganization Act or Financing Act; and economic enterprise under the Indian Financing Act of 1974.		percent of grazing loss, number of grazing acres, and number of eligible livestock by type and weight on Form CCC-740.	a later date.	If no listing, contact the appropriate State FSA office listed in the Farm Service Agency section of Appendix IV of the Catalog or on the WEB at http://www.fsa.usda.gov/edso/ Headquarters Office: Department of Agriculture, Farm Service Agency, Production, Emergencies, and Compliance Division, Emergency Preparedness and Program Branch, Stop 0517, 1400 Independence Avenue SW., Washington, DC 20250-0517. Telephone: (202) 720-7641. http://www.fsa.usda.gov
USDA; Rural Business-Cooperative Service	Renewable Energy Systems and Energy Efficient Improvements Program	To create a program to make direct loans, loan guarantees and grants to agricultural producers and rural businesses to help reduce energy costs and consumption.	To create a program to make direct loans, loan guarantees and grants to agricultural producers and rural businesses to help reduce energy costs and consumption and help meet the nation's critical energy needs.	Agricultural producer or rural small business.	Rural Energy Coordinator in the State.	Application must be submitted to the rural Energy Coordinator who will score it and submit to the National Office. The Highest scored application nationally will receive funding.	Continual sign-up process.	The Rural Business-Cooperative Service State Office.
USDA; Rural Business-Cooperative	Rural Business Enterprise Grants	Project Grants to create, expand or operate rural distance learning	To facilitate the development of small emerging business, industry and related	Public bodies and nonprofit corporations serving rural	From the Rural Business Cooperative Service or the State Coordinating Agency.	The pre-application is filed with the local office. After review it will be reviewed and processed by the State office.	None.	Regional or local office.

Table 4-4b
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
Service		networks or programs for education, job training instruction related to potential employment, job advancement; development, construction, acquisition, land, buildings, plants, equipment, access streets and roads, parking areas, utility extensions, water supply, waste water disposal facilities, refinancing, services and fees or to establish a revolving loan fund.	employment for improving the economy of rural areas.	areas.				
USDA; Rural Business– Cooperative Service	Rural Business Opportunity Grants	Project grants to be used to assist in economic development of rural areas by providing technical assistance, training, and planning for business and economic development.	To promote sustainable economic development in rural communities with exceptional needs.	Public bodies, nonprofit corporations, Indian tribes and cooperatives with members that are primarily rural residents and that conduct activities for the mutual benefit of their members.	From the Rural Development State office or the State Coordinating Agency.	Applications will be scored and awards announce.	None.	Regional or local office.
USDA; Rural Business– Cooperative Service	Rural Cooperative Development Grants	Project Grants to facilitate the creation or retention of jobs in rural area through the development of new rural cooperative, value added processing and rural business.	To improve economic conditions in rural areas through cooperative development.	Nonprofit corporation and institutions of higher learning.	From the Rural Business Cooperative Service or the State Coordinating Agency.	The National Office reviews all applications, scores and ranks them.	Published in Federal Register.	Regional or local office.
USDA;	Rural	Direct Loans and	For rural economic	Electric and	Rural Development	See 7 Code of Federal Regulation,	None.	Regional or local office.

Table 4-4b
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
ECONOMIC DEVELOPMENT								
Rural Business– Cooperative Service	Economic Development Loans and Grants	Project Grants for project feasibility studies, start-up costs, incubator projects and other reasonable costs for the purpose of fostering rural development.	development and job creation projects.	telephone utilities that have current loans with the Rural Utilities Service or rural telephone Bank loans or guarantees outstanding.	State Office.	Section 1703.34.		
USDA; Farm Service Agency	Tree Assistance Program	Direct payments with unrestricted use to tree, bush and vine owners who have trees, bushes and vines lost to a natural disaster, to replant or rehabilitate said vegetation and produce annual crops for commercial.	To assist producers whose trees, bushes or vines are damaged or destroyed in natural disasters.	Individual owners.	A form provided by FSA; a written estimate of the number or trees, bushes or vines lost or damaged which is prepared by the owner or someone who is a qualified expert, as determined by the county Committee; the number of acres on which the loss was suffered; and sufficient evidence of the loss to allow the County Committee to calculate whether an eligible loss occurred.	The County Committee makes recommendations and eligibility determinations on those determinations that it wants to recommend to a higher approval official.	To be announced.	Regional or local office.
USTREAS	Casualties, Disasters, and Theft	Tax relief.	The program offers tax relief for casualty losses that result from the destruction of, or damage to your property from any sudden, unexpected, or unusual event such as a flood, hurricane, tornado, fire, earthquake or even volcanic eruption.	A victim of a Presidentially declared disaster and you must be a taxpayer who is interested in receiving tax information and preparation assistance.	Contact IRS, http://www.irs.gov/taxtopics/tc515.html	Casualty losses are claimed on Form 4684 (PDF), <i>Casualties and Thefts</i> . Section A is used for personal-use property and Section B is used for business or income-producing property. If personal-use property was destroyed or stolen, you may wish to refer to Publication 584, <i>Casualty, Disaster, and Theft Loss Workbook</i> , to help you catalog your property. If the property was business or income-producing property, refer to Publication 584B (PDF), <i>Business Casualty, Disaster, and Theft Loss Workbook</i> .	Check website, http://www.irs.gov/pub/irs-pdf/p547.pdf	For additional information contact: Internal Revenue Service Tax forms and Publications W:CAR:MP:FP 1111 Constitution Ave NW Washington, DC 20224. http://www.irs.gov/taxtopics/tc515.html

**Table 4-4c
Federal Technical Assistance and Funding**

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
EMERGENCY MANAGEMENT								
DHS	Community Disaster Loans	Loan.	To provide loans subject to Congressional loan authority, to any local government that has suffered substantial loss of tax and other revenue in an area in which the President designates a major disaster exists. The funds can only be used to maintain existing functions of a municipal operating character and the local government must demonstrate a need for financial assistance	Applicants must be in a designated major disaster area and must demonstrate that they meet the specific conditions of FEMA Disaster Assistance Regulations 44 CFR Part 206, Subpart K, Community Disaster Loans.		Upon declaration of a major disaster, application for a Community Disaster Loan is made through the Governor's Authorized Representative to the Regional Director of FEMA. The Associate Director of the Response and Recovery Directorate approves or disapproves the loan. The Designated Loan Officer will execute a Promissory Note with the applicant. The promissory note must be co-signed by the State, or if the State cannot legally co-sign the note, the local government must pledge collateral security.	The loan must be approved in the fiscal year of the disaster or the fiscal year immediately following.	Regional or Local Office. http://www.dhs.gov
DHS	Disaster Legal Services	Legal assistance.	To provide legal assistance to individuals affected by a major Federal disaster.	Low-income individuals, families, and groups.	An applicant should consult the office or official designated as the single point of contact in his or her State for more information on the process the State requires to be followed in applying for assistance, if the State has selected the program for	Upon declaration of an emergency or major disaster, individuals and households may register an application for assistance with FEMA via a toll-free number or by visiting a Disaster Recovery Center.	Not applicable.	Regional or Local Office. http://www.dhs.gov

Table 4-4c
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
EMERGENCY MANAGEMENT								
DHS	Disaster Unemployment Assistance	Direct Payments for Specified Use; Provision of Specialized Services.	To provide special federally funded weekly benefits to workers and self-employed individuals who are unemployed as a direct result of a Presidentially-declared major disaster, and who are not eligible for regular Unemployment Insurance benefits paid by States.	Disaster victims who have experienced direct loss of employment as a result of a Presidentially-declared major disaster designated for DUA.	review. From the local State Workforce Agency (SWA).	Upon declaration of a major disaster declaration designated for DUA, individuals may apply with their local State Workforce Agency (SWA).	Generally, applications for DUA must be filed within 30 days after the date of the SWA announcement regarding availability of DUA. When applicants have good cause, they may file claims after the 30-day deadline. However, no initial application will be considered if filed after the 26th week following the declaration date.	Regional or Local Office.
DOC; NOAA; Marine Fisheries Service	Fisheries Disaster relief	Cooperative Grants (75/25)	Assessment of the effects of Commercial Fishery failures, restoring fisheries, preventing future failures and assisting fishing communities affected by failures.	Fishing Communities.	National Marine Fisheries Service (NMFS).	Submit completed forms to NMFS through Grants.GOV	120 days before start of project.	National Marine Fisheries Service. http://www.nmfs.noaa.gov/
DOD	Emergency Rehabilitation of Flood Control Works or Federally Authorized Coastal Protection Works	Repair of Flood Control or Coastal Protection Works.	To assist in the repair and restoration of flood control works damaged by flood, or federally authorized hurricane flood and shore protection works damaged by extraordinary wind, wave, or water action.	Owners of damaged flood protective works, or State and local officials of public entities responsible for their maintenance, repair, and operation must meet current guidelines to become eligible for Public Law 84-99 assistance.	District Engineer or Corps of Engineers	Written application by letter or by form request if such form is locally used by the District Engineer of the Corps of Engineers.	Thirty days after a flood or unusual coastal storm.	Regional or Local Office: U.S. Army Corps of Engineers Division or District Engineers. Headquarters Office: Commander, U.S. Army Corps of Engineers, Attn: CECW-OE, Washington, DC 20314. Telephone: (202) 272-0251. FTS is not available. http://www.usace.army.mil/business.html
SBA	Economic Injury Disaster Loans	Loans to businesses suffering economic injury from Presidential, SBA, or Agricultural Disaster.	To provide working capital to small business, small agricultural cooperatives or nurseries who have actual economic injury.	Business owners who have suffered economic injury.	SBA Disaster Office.	File with nearest SBA Disaster Office.	Deadline established after each declaration.	SBA Disaster Office.
SBA	Physical Disaster Loans	Loans to victims of declared	To repair or replace damaged or destroyed	Loans to homeowners, renters, business and	SBA Disaster Office.	File with nearest SBA Disaster Office.	60 days from disaster declaration unless extended	SBA Disaster Office.

Table 4-4c
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
EMERGENCY MANAGEMENT								
		disasters for uninsured or otherwise uncompensated physical damage.	real and/or personal property to its pre-damage condition. The loan limit may increase by 20% to provide protective measures.	non-profit organizations who have suffered physical loss do to a Presidential or SBA declared disaster.			by SBA.	
USDA	Direct Housing, Natural Disaster Grants and Loans	Repair or replace damaged Property.	To meet emergency assistance needs not provided by FEMA Programs.	Very-Low income owner-occupants of rural housing in declared disaster areas. Must be 62 years or older.	Rural Development Field Office of the applicants County.	Complete Form 410-4 and return to field office.	From Date of Declaration until appropriated funds are exhausted.	U.S.D.A. Rural Development Field Office.
USDA	Disaster Reserve Assistance	Direct Payments for Specified Use.	To provide emergency assistance to eligible livestock owners, in a State, county, or area approved by the Secretary or designee, where because of disease, insect infestation, flood, drought, fire, hurricane, earthquake, hail storm, hot weather, cold weather, freeze, snow, ice, and winterkill, or other natural disaster, a livestock emergency has been determined to exist.	An established producer or husbandry of livestock or a dairy producer. a farm cooperative, private domestic corporation, partnership, or joint operation in which a majority interest is held by the members, stockholders, or partners who are citizens of, or legal resident aliens of the United States. Any Indian tribe or tribal organization of the Indian Self-Determination and Education Assistance Act. Any organization under the Indian Reorganization Act or Financing Act.	Visit the county FSA office in the eligible county.	Applicants visit the county FSA office in the eligible county to make application, certify eligibility and report feed loss, feed available, and eligible livestock related to the disaster occurrence; and (2) applicants also receive authority to participate in the program as provided by the approving official.	Feeding periods for the disaster reserve assistance program begin (a) the first day of the 1996 crop year in counties approved for 1995 or 1996 livestock feed programs; (b) the date the producer filed an application, if the natural disaster began after the beginning of the 1996 crop year; the date of the occurrence for sudden natural disasters that occurred after the beginning of the 1996 crop year.	Regional or Local Office http://www.fsa.usda.gov
USDA	Emergency Loans	Direct Loans.	To assist established (owner or tenant) family farmers, ranchers and aquaculture operators with loans to cover losses resulting from major and/or natural disasters, which can be used for annual farm operating	Be an established family farmer, rancher, or aquaculture operator (either tenant-operator or owner-operator), who was conducting a farming operation at the time of occurrence of the disaster either as an individual proprietorship, a partnership, a	Consult the appropriate FSA State office.	Application Form FSA 410-1 provided by the Farm Service Agency must be presented, with supporting information, to the FSA county office serving the applicant's county. FSA personnel assist applicants in completing their application forms. This	Deadline for filing applications for actual loss loans is 8 months from the date of declaration/designation for both physical and production losses. Applicants should consult the FSA county office serving their area for application deadlines.	Regional or Local Office http://www.fsa.usda.gov

Table 4-4c
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
EMERGENCY MANAGEMENT								
			expenses, and for other essential needs necessary to return disaster victims' farming operations to a financially sound basis in order that they will be able to return to private sources of credit as soon as possible.	cooperative, a corporation, or a joint operation. Have suffered qualifying crop loss and/or physical property damage caused by a designated natural disaster. Be a citizen of the United States or legal resident alien, or be operated by citizens and/or resident aliens owning over a 50 percent interest of the farming entity. Have sufficient training or farming experience in managing and operating a farm or ranch. Be a capable manager of the farming, ranching, or aquaculture operations.		program is excluded from coverage under OMB Circular No. A-110.		

Table 4-4d
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HISTORIC PRESERVATION								
DOI; National Park Service	Civil War Battlefield Land Acquisition Grants	Grants for Fee simple acquisition of land, or for the acquisition of permanent protective interests in land at Civil War Battlefields.	To preserve threatened civil war battlefields.	Local governments or private non-profit organization in partnership with local governments.	SF 424 and attached documents including hard copies of proposals. See application requirements for list of attachments.	File forms with National Park Service Office.	Ongoing.	National Park Service. http://www.nps.gov/
DOI; National Park Service	National Maritime Heritage Grants	Education activities and preservation activities or projects, such as: 1) activities associated with acquiring ownership of, or responsibility for, historic maritime properties for preservation purposes; 2) preservation planning; 3) documentation of historic maritime properties; 4) protection and stabilization of historic maritime properties; 5) preservation restoration, or rehabilitation of historic maritime properties; 6) maintenance of historic maritime properties; and 7) reconstruction or reproduction of well-documented historic maritime properties.	To preserve historic maritime resources and increase public awareness and appreciation.	Local governments and private non-profit organizations.	National Maritime Initiative.	State Historical Preservation Office or National Maritime Initiative.	Contact State Historical Preservation Office or National Maritime Initiative.	National Park Service Office, National Maritime Initiative. http://www.cr.nps.gov/Maritime/
DOI; National Park Service	Technical Preservation Service	Advisory services and counseling, dissemination of technical information, provision of specialized services.	To assist local governments and owners of certified historical structures to preserve and maintain properties.	Local governments and individuals.	Historic Preservation Certification Application through Appropriate State Official or NPS Office.	File through State Official or NPS Office.	None.	National Park Service Office. http://www.nps.gov/

Table 4-4e
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
DHS	Disaster Housing Assistance To Individuals And Households In Presidential Declared Disaster Zones	Direct Payments for Specified Use.	To provide assistance to affected individuals and households within Presidential-declared disaster zones to enable them to address disaster-related housing and other necessary expenses and serious needs, which cannot be met through other forms of disaster assistance, insurance, or through other means.	Individuals and households, in areas declared an emergency or major disaster by the President, whose primary residence has been damaged or destroyed and whose losses are not covered by insurance are eligible to apply for this program. Must be a citizen of the United States, a non-citizen national, or a qualified alien.	An applicant should consult the office or official designated as the single point of contact in his or her State for more information on the process the State requires to be followed in applying for assistance, if the State has selected the program for review.	A Presidential Disaster or Emergency Declaration must be issued, before individuals and households can register an application for assistance with FEMA via a toll-free number or by visiting a Disaster Recovery Center.	Generally, individual and household applications for disaster assistance must be filed within 60 days of the disaster declaration.	Regional or Local Office.
DHS	Disaster Housing Program	Grant.	The Disaster Housing Program provides housing assistance in the form of a grant to individuals whose homes sustained damage as a result of a Presidentially declared disaster. To qualify for assistance, the damaged home must be your primary residence, and be	Applicant must be a national, citizen or dual citizen of the US whose home was destroyed or damaged by a Presidentially declared major disaster.	Contact FEMA.	Individuals can apply for assistance by calling 1-800-621-FEMA. Insured homeowners should first file a claim with their home insurer before contacting FEMA. An inspection is performed and a determination is made on	Contact FEMA.	Additional general information can be found at: http://www.fema.gov/tabs_disaster.shm

Table 4-4e
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
			located in the disaster-declared area. If insured, a claim should be filed. This program provides grants for lodging expense reimbursement, minimal home repairs and rental assistance. A determination of the types of housing assistance you are eligible to receive will be made if you apply.			your eligibility for one of the following types of assistance: Lodging expense reimbursement, minimal home repairs, rental assistance and Mortgage and Rental Assistance.		
DHS	Federal Assistance To Individuals And Households- Disaster Housing Operations	Direct Payments for Specified Use.	To address disaster-related housing needs of individuals and households suffering hardship who are within an area declared as a disaster zone, by the President.	Individuals and households, in areas declared an emergency or major disaster by the President, whose primary residence has been damaged or destroyed and whose losses are not covered by insurance are eligible to apply for this program. The individual or a member of the household must be a citizen of the	An applicant should consult the office or official designated as the single point of contact in his or her State for more information on the process the State requires to be followed in applying for assistance, if the State has selected the program for review.	Upon declaration of an emergency or major disaster, individuals and households may register an application for assistance with FEMA via a toll-free number or by visiting a Disaster Recovery Center.	Generally, individual and household applications for disaster assistance must be filed within 60 days of the disaster declaration.	Regional or Local Office.

Table 4-4e
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
				United States, a non-citizen national, or a qualified alien.				
DOI, Bureau of Indian Affairs	Indian Housing Assistance	Construction of housing, technical assistance to establish housing plans and determine extent and use of the Bureau's housing Improvement Program.	To eliminate substantially substandard Indian owned to inhabited housing for very low income individuals living in tribal service areas.	Individual members of Federally recognized tribes or tribal governments or organizations.	An informal conference should be scheduled with Bureau of Indian Affairs. Applications for Tribes or Tribal organizations should be submitted to Bureau of Indian Affairs local office. Individuals may submit applications to the Bureau or to the tribal Servicing Housing Office.	Process is determined through annual Tribal work plan.	For Tribes or Tribal Organizations there is no deadline. For individuals the deadline is set at the local office.	Regional or Local Office of the Bureau of Indian Affairs.
HUD	Community Development Block Grant (CDBG)	Grant.	To develop viable urban communities by providing decent housing and a suitable living environment. Principally for low-to moderate-income individuals.	Eligible CDBG grant recipients include States, units of general local government (city, county, town, township, parish, village or other general purpose political subdivision determined to be eligible for assistance by the Secretary), the District of Columbia, Puerto Rico, Guam, the Virgin Islands, American Samoa, the Commonwealth of the Northern Marianas, and	http://www.hud.gov/offices/cpd/about/cpd_programs.cfm	Community Development activities that meet long-term needs. These activities can include acquisition, rehabilitation, reconstruction of properties and facilities damaged by a disaster, and redevelopment of disaster affected areas.	Consolidated Plans may be submitted between November 15 and August 16 of each fiscal year in which the State will administer funds.	State and Small Cities Division, Office of Block Grant Assistance, CPD, HUD, 451 7th Street, S.W., Washington, DC 20410-7000. Telephone: 202.708.3587. http://www.hud.gov/bdgy2000/summary/cpd/cdbg.html

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Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
				recognized Native American tribes and Alaskan Native villages.				
HUD	Demolition and Revitalization of Severely Distressed Public Housing (HOPE VI)	Demolition of all or parts of severely distressed public housing projects, relocation cost of affected resident, disposition activities, rehabbing of units or community facilities, development of new units or community facilities, homeownership activities, acquisition activities, management improvements and administrative cost, community and supportive services.	To fund revitalization of severely distressed public housing developments.	Public housing authorities and Indian Housing Authorities, plus local governments for HOPE VI Main Street Grants.	Submission requirements and application are listed in Notice of Federal Assistance in the Federal Register.	HUD HQ reviews the application and rates them. Highest rated applications are funded.	As indicated in the Federal Register Notice.	HUD local or regional Office.
HUD	Mortgage insurance-Homes for Disaster Victims	Guaranteed / Insured Loans.	To insure lenders against losses on mortgage loans used to finance purchase or reconstruction of one-family home that will be the principal residence of a borrower that is a victim of a disaster.	Individuals and Families that are victims of a disaster designated by the President.	Mortgagee submits Application to HUD Field Office.	Mortgagee submits Application to HUD Field Office.	None.	HUD local or regional Office.

Table 4-4e
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
HUD	Rehabilitation Mortgage Insurance	Guaranteed / Insured Loans.	To insure lenders against losses on mortgage loans for 1 to 4 unit structures used to finance the purchase of a structure and land and rehabilitate the structure; the purchase, relocation and rehabilitation of a structure from another site; refinance existing debt and rehabilitating a structure; finance the rehabilitating of a structure.	Individual purchasers.	A HUD Approved Lending Institution	Review by Lending Institution.	None.	HUD local or regional Office.
HUD	Rural housing and Economic Development	Grants for Capacity Building, Support of Innovative Housing and Economic Development Activities.	To build capacity for rural housing, and economic development activities in rural areas.	Local Rural Non-Profit Organizations, Community Development Corporations, Indian Tribes, State agencies.	Submission requirements and application are listed in Notice of Federal Assistance in the Federal Register	As indicated in the Federal Register Notice.	As indicated in the Federal Register Notice.	HUD local or regional Office.
HUD	Self-Help Homeownership Opportunity Program (SHOP)	Land Acquisition and Infrastructure Improvements	To facilitate and encourage innovative homeownership opportunities were homeowner are low-income and contribute a significant	National or regional non-Profit Organizations or Consortia.	Submission requirements and application are listed in SHOP Notice of Federal Assistance in the Federal Register.	As indicated in the Federal Register Notice.	As indicated in the Federal Register Notice.	HUD local or regional Office.

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Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
HUD	Supplemental Loan Insurance-Multifamily Rental Housing	Financing of repairs, additions and improvements to multifamily projects, group practice facilities, hospitals and nursing homes already insured by HUD.	To insure lenders against losses on loans to finance additions and improvements to eligible properties.	Owners of Multifamily projects or facilities subject to mortgage insured by HUD or individual s/families and owners of multifamily projects.	HUD Multifamily HUB and Program Center.	Pre-application conference and then submittal of formal application through HUD approved mortgage.	Case-by-case basis.	HUD local or regional Office.
USDA	Direct Housing-Natural Disaster	Direct loans.	To assist qualified lower income rural families to meet emergency assistance needs resulting from natural disaster to buy, build, rehabilitate, or improve dwellings in rural areas. Funds are only available to the extent that funds are not provided by the Federal Emergency Management Agency (FEMA). For the purpose of administering these funds, natural disaster	Applicants must be without adequate resources to obtain housing or related facilities. Applicants must be unable to secure the necessary credit from other sources at prevailing terms and conditions for residential financing.	Rural Development Field office.	Applicants must file Form RD 410-4 at the Rural Development field office serving the county where the dwelling is located. This program is excluded from coverage under OMB Circular No. A-110.	Applicants must file applications from the date of declaration/designation and until supplemental appropriated funds are exhausted.	Regional or Local Office. Consult your local telephone directory under United States Department of Agriculture for Rural Development field office number. If no listing, contact appropriate Rural Development State Office at: http://www.rurdev.usda.gov/recd_map.html .

Table 4-4e
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
			will only include those areas identified by a Presidential declaration.					
USDA; Rural Housing Service	Farm Labor Housing Loans and Grants	Project grants and Guaranteed/insured Loans for the construction, repair or purchase of year-around or seasonal housing; acquiring land and making improvements for housing; developing related support facilities.	To provide decent, safe and sanitary low-rent housing and related facilities for domestic farm laborers.	Farmers, farm family partnerships, family farm corporations, or an association of farmers.	Applicant must furnish the following information: the number of farm laborers currently being used in the area; the kind of labor performed; the future need for labor; the kind, condition, and adequacy of current housing; the ownership of current housing; the ability of workers to pay rent; and information that it is unable to provide housing from its own resources or terms and conditions that would enable it to provide labor housing.	Applications will be scored and reviewed by State and National Offices.	None.	Regional or Local Office of Rural housing Service. http://www.rurdev.usda.gov/rhs/
USDA; Rural Housing Service	Rural Housing Preservation Grants	Loans, grants or other assistance to individual homeowners, rental properties or coops to pay any part of the cost for repair and rehabilitation of structures.	To assist very low- and low-income residents individual homeowners, rental property owners (single/multi-unit and consumer cooperative housing projects to complete necessary repairs and rehabilitation of dwellings.	Political subdivision of state, public non-profit corporation, or Indian tribal Corporations authorized to receive and administer housing preservation grants, private nonprofit corporations, or consortia.	Contact your regional or local office.	Consult with Rural Development Office prior to application and submit pre-application. An Environmental Impact Assessment is required.	See Federal Register of Notice of Funds Availability.	Regional or Local Office of Rural housing Service. http://www.rurdev.usda.gov/rhs/
USDA; Rural Housing Service	Section 538 Rural rental Housing Guaranteed Loans	Guaranteed/Insured Loans to supply affordable multi-family housing in rural areas.	To encourage private and public lenders to make loans for affordable rental	Lenders.	Lender provides documentation required by RHS.	RHS will review applications for compliance and issue conditional Commitment of guarantee with	See Federal Register of Notice of Funds Availability.	Regional or Local Office of Rural housing Service. http://www.rurdev.usda.gov/rhs/

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Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
HOUSING								
			properties.			conditions. Once Conditions are met the final Contract of guarantee will be issued.		
USDA; Rural Housing Service	Very Low-Income housing Repair Loans and Grants	Direct Loans and Project Grants to Very-Low Income Homeowners in rural areas to repair, improve or modernize their dwellings or to remove health and safety hazards.	To make essential repairs to homes to make them safe and remove health hazards.	Applicant must own and occupy the home in a rural area, have sufficient income to repay a loan, be 62 years of age or older and be unable to repay a loan for that part of the assistance that comes as a grant.	Rural Development State or District Office.	The Loan must be submitted to RHS field office serving county where structure is located.	None.	Regional or Local Office of Rural housing Service. http://www.rurdev.usda.gov/rhs/
USDA; Rural Housing Service	Very Low to Moderate Income Housing Loans	Direct and Guaranteed Loans to buy, build, or improve applicant's permanent residence. New manufactured loans on a permanent site may also be approved.	To assist very low, low-income, and moderate households to obtain modest, decent, safe, and sanitary housing for use as a permanent residence in a rural area.	Very low, low-income, and moderate households.	For Direct Loans the application is made to the local Rural Development Office. For Guaranteed Loans application is made to the lender.	For Direct Loans the Rural Development Office makes a decision within 30 – 60 days. For Guaranteed Loans the decision is made within 3 days.	None.	Regional or Local Office of Rural housing Service. http://www.rurdev.usda.gov/rhs/

Table 4-4f
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
INFRASTRUCTURE								
DHS	National Dam Safety Program	State grants distributed directly to State dam safety programs.	To reduce the risks to life and property from dam failure in the United States through the establishment and maintenance of an effective national dam safety program to bring together the expertise and resources of the Federal and non-Federal communities in achieving national dam safety hazard reduction.	For a State to be eligible for primary assistance under the National Dam Safety Program, the State dam safety program must be working toward meeting the following criteria: The authority to review and approve plans and specifications to construct, enlarge, modify, remove, and abandon dams; the authority to perform periodic inspections during dam construction to ensure compliance with approved plans and specifications. All inspections be performed under the supervision of a State-registered professional engineer with experience in dam design and construction.	www.fema.gov/fima/damsafe	States wishing to participate in the National Dam Safety Program must submit a proposal with their application package including a program narrative statement, goals and objectives, performance measures, travel budget and related activities.	Applications should be submitted to FEMA by November 30 of each fiscal year.	<i>Headquarters Office:</i> Director, National Dam Safety Program, Mitigation Directorate, FEMA, DHS, 500 C Street SW., Washington, DC 20472; Telephone: (202) 646-3885. Additional information is available on the National Dam Safety Program web site, www.fema.gov/fima/damsafe
DOC; EDA	Grants for Public Works and Economic Development Facilities	Project grants for water and sewer improvements, industrial access roads, industrial and business parks, port facilities, railroad sidings, distance learning facilities, skill-training facilities, redevelopment of brown fields, eco-industrial facilities, business incubator facilities, and	To promote long-term economic development in areas experiencing substantial economic stress.	Cities, counties, institutions of higher education or a consortium of institutions of higher education, other political subdivision, Indian Tribes, Economic Development Districts and non-profit organizations.	The Economic Development Representative servicing the state or EDA.	Meet with EDR. If deemed appropriate the applicant will be invited to apply.	30 days after invitation.	Regional or Local Office. http://www.eda.gov/Contacts/Contacts.xml

Table 4-4f
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
INFRASTRUCTURE								
		telecommunication infrastructure improvement needed for business retention and expansion.						
DOC; National Telecommunication and Information Administration	Public Telecommunications Facilities Planning and Construction	Grants for planning and construction of public telecommunications facilities.	To assist in the planning, acquisition, installation, and modernization of public telecommunications facilities through planning grants and matching construction grants.	Public or non-commercial educational broadcast station, noncommercial telecommunication entity, non-profit foundation, corporation, institution or association organized primarily for educational or cultural purposes, local government, tribal government or an agency thereof, or a political or special purpose subdivision of the state.	Request from agency or go to the web at: www.ntia.doc.gov/ptfp .	File application form, project narrative, project budget forms, relevant exhibits, CD-511, CD 346, SF 424B, and SF LLL. Contact State telecommunications agency where applicable.	See annual notification in the Federal Register.	Regional or Local Office. http://www.ntia.doc.gov/
DOD; USACE	Flood Control Works / Emergency Rehabilitation	Provision of Specialized Services.	To assist in the repair and restoration of public works damaged by flood, extraordinary wind, wave, or water action.	Owners of damaged flood protective works, or State and local officials of public entities responsible for their maintenance, repair, and operation.	Regional or Local Office: U.S. Army Corps of Engineers Division or District Engineers.	The Corps provides public works and engineering support to supplement State and local efforts toward the effective and immediate response to a natural disaster.	Thirty days after a flood or unusual coastal storm.	Program Manager PL 84-99 USACE, 20 Massachusetts Ave, N.W. Washington, DC 20314 Telephone: 202.761.0001. http://www.spd.usace.army.mil/hqpam.html
DOD; USACE	Protection of Essential Highways, Highway Bridge Approaches and Public Works	Protection of highways, highway bridges, essential public works, churches, hospitals, schools and other non-profit public services.	To provide bank protection for locations endangered by flood-caused erosion.	Political subdivision of states and other responsible local agencies established under state law with full authority and ability to undertake legal and financial responsibilities.	Formal letter to District Engineer.	Consult with District Engineer.	None.	Regional or Local Office. http://www.usace.army.mil/business.html
DOI; Bureau of Reclamation	Water Desalination	Demonstration and development projects	To develop cost-effective,	Local entities, public/nonprofit	A proposal solicitation is announced by the Bureau of	There will be a general solicitation	Varies, contact	Bureau of Reclamation http://www.usbr.gov/

Table 4-4f
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
INFRASTRUCTURE								
	Research and Development Program	and related activities.	technically efficient and implementable methods by which water can be produced.	institutions/organizations, other public institutions/organizations.	Reclamation.	d one for pilot plants or demonstration projects, SF 424 and DI-2010 forms are required.	Bureau of Reclamation.	(303) 445-2432.
FHWA; FAA	Airport Improvement Program	Project Grants and advisory services and counseling.	Integrated airport system planning and airport master planning, construction and rehabilitation at public-use airports.	Counties, municipalities, other public agencies, Indian tribes, private owners of public-use reliever airports or airports having at least 2,500 passengers boarding annually and receiving scheduled passenger aircraft.	Contact the States single-point contact for aviation.	Pre-application is filed with the FAA office and reviewed regionally and/or in Washington D.C.	January 31 or another date specified in the Federal Register.	Regional or Local Office. http://www.faa.gov/about/office_org/
FHWA; FTA	Federal transit Capital Investment Grants	Formula Grants and Project Grants.	To assist in financing the acquisition, construction, reconstruction and improvement of facilities, rolling stock and equipment for use in public transportation service.	Municipalities and other subdivisions of the state, public agencies and instrumentalities of one or more states, public corporations. Boards and commissions.	Federal Transportation Authority or State single point of contact.	Applicant should contact the State single point of contact.	Contact FTA.	Regional or local office. http://www.fta.dot.gov/4_ENG_HTML.htm
FHWA; FTA	Transit Planning and Research	Project Grants, Technical Information, and Training.	Increase public ridership, improve safety and emergency preparedness, improve capital operating efficiencies, protect the environment and promote energy independence.	Public bodies, non-profit institutions, local agencies, universities and legally constituted public agencies and operators of public transportation services, and non-profit organizations.	Federal Transportation Authority.	Pre-Application Coordination.	None.	Associate Administrator for Research, Demonstration and Innovation, FTA (202) 366-4209. http://www.fta.dot.gov/4_ENG_HTML.htm
FHWA	Transportation: Emergency	Special funding and technical assistance to	To provide aid for repair of Federal-	State highway/transportation	www.fhwa.dot.gov	It is the responsibility of individual States to	Contact FHWA.	Director, Office of Engineering, FHWA, DOT, 400 7th Street, S.W.,

Table 4-4f
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
INFRASTRUCTURE								
	Relief Program	States and Federal agencies.	aid roads.	agency or Federal agency.		request ER funds for assistance in the cost of necessary repair of Federal-aid highways damaged by natural disasters or catastrophic failures. A notice of intent to request ER funds filed by the State Department of Transportation with the FHWA Division Office located in the State will initiate the ER application process.		Washington, DC 20590. Telephone: 202.366.4655. http://www.fhwa.dot.gov/programadmin/erelief.html
USDA; Rural Utilities Service	Water and Waste Disposal Systems for Rural Communities	Project Grant, Direct Loans, guaranteed/Insured Loans for the installation, repair, improvement or expansion of rural water facilities including distribution lines, well pumping facilities and cost related thereto, and the installation, repair, improvement, or expansion or rural waste disposal facilities including the collection, and treatment of sanitary, storm and solid wastes.	To provide basic human amenities, alleviate health hazards and promote orderly growth of rural area.	Municipalities, counties and other political subdivisions of a states, such as authorities, associations, cooperatives, corporations operated on a not for profit basis, and federally recognized tribes. Serving rural businesses and rural residents.	Local USDA Rural Development Office.	Application is reviewed at the local level and forwarded to Rural Development State Director for review.	None.	Regional or local office. http://www.rurdev.usda.gov/recd_map.html
USDA; Rural Utilities Service	Water and Waste Disposal Loans and Grants (Section 306C)	Project Grants, Direct Loans to construct enlarge, extend or otherwise improve community water or	Provide water and waste disposal facilities and services to low income rural	Local levels of government, federally recognized tribes and non-profit associations. Per capita income may	Local USDA Rural Development Office.	Application is reviewed at the Rural Development State office and must compete on a	None.	Regional or local office. http://www.rurdev.usda.gov/recd_map.html

Table 4-4f
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
INFRASTRUCTURE								
		waste systems; extend lines; and connect individual residences to the system.	communities whose residents face significant health risks.	not exceed 70% of national average, unemployment rate is not less than 125% of national average, and residents must face significant health risks due to not having access to an affordable community water and/or waste disposal system.		national basis for review.		

**Table 4-4g
Federal Technical Assistance and Funding**

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
DHS	Emergency Management Performance Grants (EMPG)	Formula Grants.	To encourage the development of comprehensive emergency management, including for terrorism consequence management, at the State and local level and to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities.	Funding provided to States, which can be used to educate people and protect lives and structures from natural and technological hazards.	An applicant should consult the office or official designated as the single point of contact in his or her State for more information on the process the State requires to be followed in applying for assistance, if the State has selected the program for review. Technical assistance is available for application preparation from the FEMA Regional Offices.	Applications must be submitted online using the OJP GMS and must contain information and meet the requirements outlined in the program guidelines and application kit.	Applications will be made available on December 2, 2004, and must be received by ODP no later than January 16, 2005.	Office of Financial Management, FEMA, 500 C Street, S.W., Washington, DC 20472 Telephone: 202.646.7057. http://www.fema.gov
DHS	Flood Mitigation Assistance Program	Grants to States.	To help States and communities plan and carry out activities designed to reduce the risk of flood damage to structures covered under contracts for flood insurance.	The State or community must first develop (and have approved by FEMA) a flood mitigation plan that describes the activities to be carried out with assistance provided under this program. The plan must be consistent with a comprehensive strategy for mitigation activities, and be adopted by the State or community	Applications can be obtained from the State Hazard Mitigation Officer. Eligible projects include acquisition, elevation, or relocation of National Flood Insurance Program (NFIP)-insured structures, especially those that have been repetitively flooded or substantially damaged.	The State Hazard Mitigation Officer applied to the Federal Emergency Management Agency for annual funds.	Annual.	Risk Reduction Branch, Mitigation Division, FEMA, DHS 500 C Street SW., Washington, DC 20472; Telephone: (202) 646-2856. Additional information is available on FEMA's web site, www.fema.gov/fima/planfma.shtm

**Table 4-4g
Federal Technical Assistance and Funding**

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
DHS	Hazard Mitigation Grant Program	Grants.	To prevent future losses of lives and property due to disasters; to implement State or local hazard mitigation plans; to enable mitigation measures to be implemented during immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area.	following a public hearing. State and local governments; certain private and nonprofit organizations or institutions; Indian tribes or authorized tribal organizations; and Alaska Native villages or organizations.	For more information on where to obtain application go to website, http://www.fema.gov/fima/hmcp/hmcp_ref.shtm	Eligible applicants apply for the program through the State, as the State administers the program. Applicants are encouraged to contact the State Hazard Mitigation Officer for details. Each State has a hazard mitigation administrative plan that explains procedures for administering the HMGP. When the State requests a disaster declaration, it must also request that HMGP funding be made available. Individuals applying for a Hazard mitigation Grant can do it through their communities.	The State will submit all selected local applications or summaries to the Regional Director within 90 days after the State Hazard Mitigation Plan is approved. (Approximately 9-18 months after disaster declaration.)	Branch Chief, Risk Reduction Branch, Mitigation Division, FEMA, DHS, 500 C Street SW., Washington, DC 20472; Telephone: (202) 646-2856. Additional information is available on FEMA's web site, www.fema.gov
DHS	National Flood Insurance Program	Formula grants to States.	To enable persons to purchase insurance against physical damage to or loss of buildings and/or	Flood insurance can be made available in any community (a State or political	Contact State Hazard Mitigation Officer for details.	Community officials must submit an NFIP eligibility application form, which is available	Communities with one or more identified special flood hazard areas	Regional or Local Office. Contact the appropriate FEMA regional office, or the State office responsible for coordinating the program's activities.

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
			contents therein caused by floods, mudslide (i.e., mudflow), or flood-related erosion, thereby reducing Federal disaster assistance payments, and to promote wise floodplain management practices in the Nation's flood-prone and mudflow-prone areas.	subdivision thereof with authority to adopt and enforce floodplain management measures for the areas within its jurisdiction) that submits a properly completed application to FEMA.		from the FEMA, together with: copies of adopted floodplain management measures meeting the minimum standards of 44 CFR Section 60.3(a), 60.3(b), 60.3(c), 60.3(d), and/or 60.3(e), as appropriate for the type of flood hazards identified; a list of any incorporated communities within the applicant's boundaries; and estimates of population and, by kind, of buildings situated in the known flood-prone areas of the community. Such Applications should be submitted to the Mitigation Directorate, FEMA, Washington, DC 20472. This program is excluded from coverage under OMB Circular No. A-110.	must enter the program within 1 year after the identification of those areas or else prohibitions against Federally related financial assistance for acquisition or construction purposes in identified special flood hazard areas take force. Once the community does qualify, after the prescribed date, these prohibitions are removed. Adequate floodplain management measures must be in effect within 6 months of the date that the special flood hazard area is identified and within 6 months of the date flood water surface elevations are provided.	
DHS	Public Assistance Program	Grants to States and Communities.	To provide supplemental assistance to States,	State and local governments and any political	An applicant should consult the office or official designated as the point-of-contact in the State for more information.	Application for Public Assistance (PA)	A Request for Public Assistance is	Public Assistance Branch, Recovery Division, FEMA, DHS, 500 C Street SW., Washington, DC 20472; or the State Emergency office.

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
			local governments, and certain private nonprofit organizations to alleviate suffering and hardship resulting from major disasters or emergencies declared by the President.	subdivision of a State, Indian tribes, and Alaskan Native villages are eligible. Also eligible are private nonprofit organizations that operate educational, utility, emergency, or medical facilities, or that provide custodial care or other essential services of governmental nature to the general public. As a condition of grants under the Stafford Act, applicants are encouraged to mitigate natural hazards.		is made through the Governor's Authorized Representative to the FEMA Regional Director in accordance with FEMA Disaster Assistance Regulations, 44 CFR 206, except as provided in Part 206.35(d) for emergency declarations involving primarily Federal responsibility.	normally submitted by the applicant within 30 days of a declaration.	Additional information is available on FEMA's web site, http://www.fema.gov/rtr/pa/
DOC; NOAA; NWS	Automated Flood Warning Systems	Funding for creating, renovating, or enhancing Automated Flood Warning Systems.	To provide funding to communities with flood or flash flood problems that affect safety of life and property for warning systems.	Counties, municipalities, educational institutions and non-profit organizations.	http://www.ofa.noaa.gov/%7Egrants/appkit.html . Applicants must also provide statement of work, project description and detailed budget narrative and justification.	Submit to: NOAA/NWS, 1325 East-West Highway, AFWS Program Manager, W/OS31, Room 13396, Silver Spring, MD. 20910.	Check with local NWS Office.	AFWS Operations Manager (631) 224-0112.
DOC; Census	Census Geography	Provide Computer	Showing results of surveys	Interested persons,	Written request.	None.	None.	Regional or Local Census Bureau Office http://www.census.gov/field/www/

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
Bureau		generated set of maps for use in conducting surveys.	geographically, determine names and current boundaries of selected statistical areas.	organizations and government agencies.				
DOC; NOAA	Geodetic Surveys and Services	To provide national, coordinated spatial reference system at various specified intervals which provide scale, orientation, coordinated positions and elevation of specific points for use in surveying, boundary delineations and demarcation, mapping, planning, and development.	To provide assistance to State local and regional agencies in the development and implementation of Multipurpose Land Information Systems/Geographic Information Systems pilot projects and spatial reference system development and/or enhancement and height modernization.	Local, municipal, universities and regional agencies.	NOAA Grants Management Division (301) 713-3228.	45-90 day review time after submittal of all documents.	Must be submitted at least 90 days in advance of desired effective date.	NOAA Grants Management Division http://www.ago.noaa.gov/grants/ (301) 713-3228.
DOD; USACE	Flood Control Projects	Design and construction of projects.	To reduce flood damages through projects not specifically authorized by Congress.	Political subdivisions of States, or other responsible agencies established under state law. Project must be engineering feasible, complete within itself and economically	Formal Letter to District Engineer From A Prospective Sponsoring Agency.	Consult with the District Office.	None.	District Office. http://www.usace.army.mil/howdoi/where.html

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
				justified. Non-federal sponsor will share equally in feasibility study, project cost, provide a cash contribution for land enhancement benefits and for features other than flood control, prevent future encroachments which might interfere with function and maintain the project.				
DOD; USACE	Flood Plain Management Services	Advisory Services and Counseling; Dissemination of Technical Information.	To promote appropriate recognition of flood hazards in land and water use planning and development through the provision of flood and floodplain related data, technical services and guidance.	Political subdivisions of States, other non-public organizations and the public.	None needed. A letter should be sent to the District Engineer of the Corps of Engineers.	Send letter of Request.	None.	District Office. http://www.usace.army.mil/howdoi/where.html
DOD; USACE	Snagging and Clearing for Flood Control	Design and construction of projects. Non-federal sponsor must provide land, easement, right-of-way; provide costs in excess of the Federal limit; maintain	To reduce flood damages.	Political subdivisions of States, or other responsible agencies established under state law.	Formal Letter to District Engineer From A Prospective Sponsoring Agency.	Consult with the District Office.	None.	District Office. http://www.usace.army.mil/howdoi/where.html

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
		project; Hold US free from damages; cost share for land enhancement or special benefits; prevent future encroachments which will interfere with proper functioning of project.						
DOI	National Fire Plan - Wildland Urban Interface Community Fire Assistance	Project Grants; Use of Property, Facilities, and Equipment; Provision of Specialized Services; Advisory Services and Counseling; Dissemination of Technical Information; Training.	To implement the National Fire Plan and assist communities at risk from catastrophic wildland fires by providing assistance in the following areas: Provide community programs that develop local capability including; assessment and planning, mitigation activities, and community and homeowner education and action; plan and implement hazardous fuels reduction activities, including the training, monitoring or maintenance associated with such hazardous fuels reduction activities, on federal land, or on adjacent nonfederal land for activities that mitigate the threat of catastrophic fire to	States and local governments at risk as published in the Federal Register, Indian Tribes, public and private education institutions, nonprofit organizations, and rural fire departments serving a community with a population of 10,000 or less in the wildland/urban interface.	Contact the appropriate State Office or the National Interagency Fire Center's web site at: http://www.nifc.gov .	Wildland Urban Interface Community Assistance is coordinated by Bureau State and Field Offices. No specific application forms apply, except for grants awarded, the standard application forms furnished by the Federal agency and required by 43 CFR Part 12, Subpart C, "Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments," and 43 CFR Part 12, Subpart F,	None.	Regional or Local Office. http://www.blm.gov/nhp/index.htm http://www.nifc.gov

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
			communities and natural resources in high risk areas; enhance local and small business employment opportunities for rural communities; enhance the knowledge and fire protection capability of rural fire districts by providing assistance in education and training, protective clothing and equipment purchase, and mitigation methods on a cost share basis.			"Uniform Administrative Requirements for Grants and Agreements With Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations", must be used by this program.		
DOI; National Park Service	Technical Preservation Services	Advisory Services, Technical Information, Specialized Services.	Technical information is provided to assist local governments and owners to preserve and maintain historic properties.	Local governments and individuals.	State historic Preservation Office.	Apply through appropriate state official or NPS Regional Office.	None.	Regional or local office.
USDA; Natural Resources Conservation Service	Soil Survey	Dissemination of Technical Information.	Soil surveys for planners, environmentalists, engineers, zoning commissions, tax commissions, homeowners, farmers, ranchers, developers, landowners and operators.	Individuals and Groups that have a need for soil survey.	Contact Natural Resources conservation Service Office.	Request from Natural Resources Conservation Service District Office	None	Natural Resources Conservation Service District Office http://www.nrcs.usda.gov/
USDA; Natural Resources Conservation Service	Watershed Protection and Flood Prevention	Project Grants sharing the cost of watershed protection measures, flood prevention, agricultural water management, water management,	Project Grants sharing the cost of watershed protection measures, flood prevention, agricultural water management, sediment control, wildlife, recreation	Counties, groups of counties, municipalities, towns or townships, soil and water conservation districts, flood	Standard Application obtained from NRCS.	Details available in State and field offices of NRCS.	None.	Natural Resources Conservation Service District Office http://www.nrcs.usda.gov/

Table 4-4g
Federal Technical Assistance and Funding

Agency	Program	Type of Assistance/ Projects Funded	Purpose	Eligible Applicants	Where To Obtain Application	Application Process	Application Deadline	For More Information
MITIGATION								
		sediment control, wildlife, recreation and in extending long term credit for these projects. Advisory Services and Counseling in designing and installing watershed works of improvement.	and in extending long term credit for these projects. Advisory Services and Counseling in designing and installing watershed works of improvement.	prevention or flood control districts, Indian tribes or tribal organizations, and non-profit agencies with authority under state law to carry out, maintain and operate watershed works of improvement.				
USDA; Natural Resources Conservation Service	Watershed Surveys and Planning	Technical assistance for planning activities to help solve water and land related resource problems.	To help solve problems of upstream rural community flooding, water quality improvement, wetland preservation and drought management.	Local water resource agency concerned with water and related land resource development, counties, municipalities, towns or townships, Indian Tribe and Tribal Organizations, and non-profit organizations.	NCRS Offices and Letter of request Addressed to State Conservationist.	NCRS Offices and Letter of request Addressed to State Conservationist.	None.	Natural Resources Conservation Service District Office http://www.nrcs.usda.gov/

SECTION 5 - MITIGATION GOALS

Goals were developed by taking into consideration both state and jurisdictional goals for mitigation. The goals or actions in this County plan are broadly aligned with the goals of the State Hazard Mitigation Plan. None of the goals or actions in this County plan contradicts the goals of the State Hazard Mitigation Plan. In fact, the Ulster County Multi-Jurisdictional Hazard Mitigation Plan Goals are in support of furthering the State's goals in many ways.

New York State Hazard Mitigation Plan Vision and Goals

New York State's 2014 Hazard Mitigation Plan Vision Statement reads:

"New York State will continually aim to reduce deaths, injuries, and economic losses stemming from natural hazards, and to lead by example in fostering community resilience and protecting the environment in the face of future natural events to improve the lives of the people of the State."

The 2014 New York State Hazard Mitigation Plan's goals are:

- **Goal 1:** Promote a comprehensive state hazard mitigation policy framework for effective mitigation programs that includes coordination between federal, state, and local organizations for planning and programs.
- **Goal 2:** Protect property including public, historic, private structures, and critical facilities and infrastructure.
- **Goal 3:** Increase awareness and promote relationships with stakeholders, citizens, elected officials, and property owners to develop opportunities for mitigation of natural hazards.
- **Goal 4:** Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects to preserve and/or restore the functions of natural systems.
- **Goal 5:** Build stronger by promoting mitigation actions that emphasize sustainable construction and design measures to reduce or eliminate the impacts of natural hazards.

Erie County Multi-Jurisdictional Hazard Mitigation Plan Goals

Hazard Mitigation Plan Goals are long-term statements of what the participating jurisdictions hope to achieve over time through implementation of the plan. They are based on the findings of the risk assessment, and apply to each jurisdiction adopting the plan (and its updates).

Erie County and its participating jurisdictions will continually aim to reduce deaths, injuries, and economic losses stemming from natural hazards through the development and implementation of long-term, cost-effective, and resilient mitigation projects; and to lead by example in fostering community resilience and protecting the environment in the face of future natural events to improve the lives of the people of the County.

Erie County's 2014 Plan Goals are as follows¹:

1. Promote disaster-resistant development.
2. Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.
3. Reduce the possibility of damage and losses due to extreme temperatures.
4. Reduce the possibility of damage and losses due to tornados and extreme winds.
5. Reduce the possibility of damage and losses due to winter storms.
6. Reduce the possibility of damage and losses due to coastal erosion and wave action.
7. Reduce the possibility of damage and losses due to flooding (including but not limited to repetitive loss properties and Lake Erie storm rises and seiches).
8. Reduce the possibility of damage and losses due to ice jams.
9. Reduce the possibility of damage and losses due to earthquakes.
10. Reduce the possibility of damage and losses due to expansive soils.
11. Reduce the possibility of damage and losses due landslides.
12. Reduce the possibility of damage and losses due to wildfires.
13. Reduce the possibility of damages to emergency and critical facilities from damage due to flooding, wildfires, and extreme winds.
14. Reduce the possibility of damages and losses to man-made hazards, particularly: epidemics, explosion, fire, hazardous materials incidents, oil spills, terrorism, and transportation accidents.

¹ Note that the term “losses”, where it appears in Goal statements, is intended to refer to monetary losses as well as other types of losses related to injury and/or loss of life.

SECTION 6 – RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

The following table (Table 6.1) represents a range of some of the types of mitigation actions that were considered by the Core Planning Group to address each of the hazards identified in this plan. This table served as a launching point for the discussion and development of specific mitigation actions for each municipality, in conjunction with a mitigation action items “Tip Sheet”, which was also distributed to members of the Core Planning Group. In addition to listing examples of mitigation actions, the Tip Sheet also provided background information regarding the selection of mitigation actions and information regarding the eligibility of mitigation actions under the various FEMA grant programs.

At a working session of the Core Planning Group on November 30, 2010, participating jurisdictions considered this range of actions and developed a mitigation strategy (action plan) for their jurisdiction. Each jurisdiction has identified and analyzed a comprehensive range of mitigation actions and projects for each hazard, and address reducing the effects of hazards on both new and existing buildings and infrastructure.

Range of Actions and Projects That Were Considered

As required by FEMA, the Core Planning Group began by identifying a comprehensive range of potential loss reduction actions and projects for each hazard. The range of potential actions that was considered is listed and described in **Table 6.1**, and is organized according to the Mitigation Goal the action is intended to help achieve. In addition to these general types of mitigation actions, the Core Planning Group and JATs also considered a series of more specific mitigation actions that had been identified throughout the course of the planning process as specific problems and/or problem areas were brought to light in their community.

Note: After considering this range of actions, some of the actions initially considered (as listed in Table 6-1) were ultimately eliminated from community action plans based on existing local conditions. Others were carried over for detailed analysis and prioritization (see Appendix D and E). The community and County action plans that were ultimately developed, together with action items spearheaded at the County level with local participation, include action items to address every hazard profiled in this mitigation plan (as further detailed in Sections 7, 8 and associated Appendices). Communities will consider widening the scope of their implementation strategies at each update to encompass a greater range of hazards, following progress or completion of the actions in their initial strategies.

SECTION 6 - RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

Table 6.1
Types of Actions Considered to Achieve Mitigation Goals

Goals		Actions	
Goal Number	Description	Action Number	Description
1	Promote disaster-resistant development.	1.A	Join the National Flood Insurance Program (for non-participating or suspended communities).
		1.B	Ensure that local comprehensive plans incorporate natural disaster mitigation techniques by requiring a courtesy- review of draft plans by the County Emergency Management Agency.
		1.C	Explore the need for hazard zoning, high-risk hazard land use ordinances, subdivision regulations, and development density controls.
		1.D	Organize an annual event / fair for homeowners, builders and county and local jurisdictions that includes sale of NOAA weather radios, dissemination of information brochures about disasters and building retrofits, demonstration of “defensible-space” concept and fire resistant construction materials (for roofs/exterior finishes and inflammable coverings for openings like chimneys and attics) etc.
		1.E	Develop a stormwater management plan that includes subdivision regulations to control run-off, both for flood reduction and to minimize saturated soils on steep slopes that can cause landslides.
2	Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.	2.A	Expand and disseminate GIS and other hazard information on the internet.
		2.B	Develop a plan and seek funding for backup electric and telecommunications systems in local government-owned critical facilities.
		2.C	Support and fund Community Emergency Response Team (CERT) programs that also include a mitigation component.
		2.D	Create a Hazard Information Center – a virtual and physical library that contains all technical studies, particularly natural resources.
		2.E	Implement public awareness, education, and outreach programs for all or targeted hazards.
		2.F	Expanding upon the parcel data in the County’s GIS to include such information as building square footage, year built, type, foundation type, and condition, would allow for a more accurate assessment of vulnerability. Use information to update plan. Ensure information will be available to the public and to relevant communities and agencies.
		2.G	Implement public notification of imminent/ongoing disaster/hazard events via web-based reverse 911 technology and portable programmable message boards.
		2.H	Procure and implement web-based emergency management software to facilitate efficient and timely disaster response and management.
		2.I	Construct specific protected facility for storage and maintenance of hazard management assets.
		2.J	Provide training for inspection and enforcement of adopted codes and ordinances.

SECTION 6 - RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

Table 6.1
Types of Actions Considered to Achieve Mitigation Goals

Goals		Actions	
Goal Number	Description	Action Number	Description
3	Reduce the possibility of damage and losses due to extreme temperatures.	3.A	Develop and distribute outreach tools for homeowners and building permit applicants on protection of structures against cold weather damage and proper maintenance of heating/cooling systems.
		3.B	Review existing emergency response plans for enhancement opportunities: work with social support agencies, homeowners associations and general public to develop and implement monitoring and warning systems focused on vulnerable populations and provision of adequate shelter facilities.
4	Reduce the possibility of damage and losses due to tornadoes and high winds.	4.A	Adopt an ordinance to require safe rooms in mobile home parks.
		4.B	Provide low interest loans (or other form of financial assistance) for building safe rooms.
		4.C	Provide technical assistance for building safe rooms.
		4.D	Adopt an ordinance to require hurricane clips on new construction.
		4.E	Install hurricane clips and wind shutters on existing development-particularly emergency facilities and shelters built before existing codes were adopted to offer some degree of wind protection.
5	Reduce the possibility of damage and losses due to winter storms.	5.A	Promote (or purchase, for critical facilities) NOAA weather radios.
		5.B	Educate residents about driving in winter storms and handling winter-related health effects.
		5.C	Ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards.
		5.D	Bury or otherwise protect utility lines to avoid power outage due to winter storms (if risk is very high then only this action might be cost-effective).
6	Reduce the possibility of damage and losses due to coastal erosion and wave action.	6.A	Establish erosion setback lines which are located landward of the NYSDEC mapped CEHAs.
		6.B	Protect erosion-prone shorelines and banks using structural measures such as beach renourishment, bulkhead construction, groins, revetments, and rock placement.
		6.C	Implement V Zone construction requirements for new development located in parcels along the Lake Erie shoreline.
7	Reduce the possibility of damage and losses due to flooding (including Lake Erie storm rises and seiches).	7.A	Join the National Flood Insurance Program (NFIP). As a participant, floodplains within the participating community will be identified and mapped. In return, the participating community will become eligible for flood insurance as long as the local governing body adopts and enforces a floodplain ordinance.
		7.B	Join the NFIP Community Rating System (CRS), under which communities implementing actions that go beyond the specified NFIP minimum are eligible for discounted flood insurance premiums.
		7.C	Obtain specialist training and certification (i.e., Certified Floodplain Manager) for local staff tasked with enforcement of relevant codes and flood-related ordinances.
		7.D	Limit uses in floodways to those tolerant of occasional flooding, including but not limited to agriculture, outdoor recreation, and natural resource areas.

SECTION 6 - RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

Table 6.1
Types of Actions Considered to Achieve Mitigation Goals

Goals		Actions	
Goal Number	Description	Action Number	Description
7	Reduce the possibility of damage and losses due to flooding (including Lake Erie storm rises and seiches).	7.E	Develop a Countywide gauging and warning system for flash and riverine flooding.
		7.F	Continue to implement best management practices for floodplain areas.
		7.G	Identify and document repetitively flooded properties. Explore mitigation opportunities for repetitively flooded properties, and if necessary, carry out acquisition, relocation, elevation, and flood-proofing measures to protect these properties.
		7.H	Identify locations/structures suitable for construction of floodwalls and other barriers such as raised roads.
		7.I	Conduct a routine stream maintenance program (for currently non-participating communities) and seek financial assistance to clean out stream segments with heavy sediment deposits.
		7.J	Develop specific mitigation solutions for flood-prone roadways and intersections. This can include, but is not limited to, actions such as culvert upgrades, drainage improvements, road raisings, etc.) Develop a work plan for when sites will be surveyed and what role can the local government play in selection and implementation of mitigation activities (e.g. any monetary or contextual support through the local capital improvement plan).
		7.K	Implement wetlands development regulations and restoration programs.
		7.L	Implement identified stormwater recharge, rate or volume projects identified in Regional Stormwater Management Plans to decrease “flash” in streams during/after storm events.
		7.M	Implement and enforce open space preservation programs.
		7.N	Implement specific actions to enhance/improve participation in/compliance with National Flood Insurance Program (NFIP).
		7.O	Investigate the construction of bulkheads and other structural waterfront protection measures to reduce damages due to erosion and flooding/waves during storm surges.
		7.P	Establish setback distances for construction in areas likely to be vulnerable to inundation, erosion, and wave action during storm surges.
		7.Q	Implement construction requirements for new development in storm surge zones similar to that required for V Zones and coastal A Zones.
8	Reduce the possibility of damage and losses due to ice jams.	8.A	Implement monitoring and early warning measures at key locations.
		8.B	Investment in ice-clearing/breaking equipment and appropriate training for county personnel.
		8.C	Construction of ice control structures such as booms, tension weirs and sloped-block barriers.

SECTION 6 - RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

Table 6.1
Types of Actions Considered to Achieve Mitigation Goals

Goals		Actions	
Goal Number	Description	Action Number	Description
9	Reduce the possibility of damage and losses due to earthquakes.	9.A	Retrofit/Reconstruct old critical facilities.
		9.B	Acquire dilapidated vulnerable structures.
		9.C	Public awareness through video/brochures about simple steps homeowners can take to mitigate damage.
		9.D	Examine provisions for earthquake resistant retrofits for existing structures and infrastructure, paying particular attention to unreinforced masonry structures built prior to the adoption of building codes requiring earthquake resistant design for new construction.
		9.E	Implement hillside and steep slope development regulations.
10	Reduce the possibility of damage and losses due to expansive soils.	10.A	Develop and adopt new guidelines for the design and construction, and assessment and repair, of residential foundations to augment the Residential Code of New York State.
		10.B	Educate homeowners, and encourage their performance of biennial house inspections and, when appropriate, retainage of a licensed engineer for repair/remediation.
11	Reduce the possibility of damage and losses due to landslides.	11.A	Create comprehensive geological mapping to areas prone to landslides and rockslides.
		11.B	Locally identify and map specific areas of potential slope failure and limit future development in these areas.
		11.C	Develop a public outreach program that addresses the economic impacts of landslides on personal property.
		11.D	Consider adopting a steep slope ordinance, if one is not already in place, to regulate development on these higher risk areas.
		11.E	Develop a vegetation management plan. Proper vegetation can supply slope-stabilizing root strength, and facilitate in intercepting precipitation. Establishing and maintaining appropriate vegetation of areas above the bluff slope may be the single most important and cost-effective mitigation measure available.
12	Reduce the possibility of damage and losses due to wildfires.	12.A	In consultation with NYSDEC Forest Protection & Fire Management and local forest rangers, develop detailed mapping of wildland/urban interface areas.
		12.B	Develop inventory of addresses for route alerting during wildfire emergencies that require public warning and information.
		12.C	In consultation with NYSDEC Forest Protection & Fire Management and local forest rangers, review local EOPs for possible wildfire components regarding Fire-Rescue, Alert Warning Communications, and Evacuation.
		12.D	Implement and enforce open space preservation programs.
		12.E	Prescribed burning for hazard reduction.
		12.F	Initiate a public outreach program for homeowners.
		12.G	Retrofit buildings with fire resistant materials, especially roofing.
		12.H	Relocate structures (in particular critical facilities) out of hazard areas.
		12.I	Community brush and debris removal and hazard fuels reduction.

SECTION 6 - RANGE OF ALTERNATIVE MITIGATION ACTIONS CONSIDERED

Table 6.1
Types of Actions Considered to Achieve Mitigation Goals

Goals		Actions	
Goal Number	Description	Action Number	Description
		12.J	FireWise landscaping in higher risk areas.
		12.K	Mitigation for streets, highways, and roads that provide key fire access and fuel breaks.
		12.L	Implement hillside and steep slope development regulations.
13	Reduce the possibility of damages to emergency and critical facilities from flooding, wildfires and extreme wind.	13.A	Conduct a study to determine the year-built and level of protection (flood, wind) for each emergency facility.
		13.B	On completion of 13.A, seek funding for mitigation projects for emergency facilities not currently designed for protection from flooding, high wind, or wildfire damage.
14	Reduce the possibility of damages and losses to man-made hazards, particularly: epidemics, explosion, fire, hazardous materials incidents, oil spills, terrorism, and transportation accidents.	Varies on a hazard-specific and more importantly a site specific basis. Includes activities such as vaccination clinics, mutual aid plans, public education, lobbying for tougher hazardous materials release laws, radio systems to allow for interagency communications, redundancy, bollards, structural strengthening of high potential targets, etc.	


* Note: The Town of Amherst is the only municipality with noted susceptibility to expansive soils impacts. Historic impacts in the Town have been studied by the USACE. The Town has already implemented the USACE's recommended mitigation actions (10.A and 10.B, above)

Erie County Multi-Jurisdictional Hazard Mitigation Plan Action Items "Tip Sheet"

 Each participating jurisdiction must identify at least one hazard mitigation action. Without doing so, FEMA will not recognize your municipality's participation.


 **Don't pick action items arbitrarily! Be sure to select mitigation actions that will address the hazard(s) posing the greatest risk in your municipality.**

 Public awareness activities can be one of your actions, but they cannot be the only action you identify. Also, be aware that FEMA mitigation project/funding streams are not viable sources of outside funding for this type of activity.


 In general, FEMA mitigation project funds may be used to facilitate projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem. In addition, a project's potential savings must be more than the cost of implementing the project.


 **Responding better is not the same as mitigating.** For example, buying additional motorboats to evacuate flooded residents is not flood mitigation; it is flood response. You want to select actions that truly reduce or eliminate impacts/damages in their own right, and reduce the likelihood of a future

 need to respond at all. For example, elevating or acquiring flood prone buildings. Response activities can be one of your actions, but they cannot be the only action you identify. And FEMA mitigation project grants are not the place to seek outside funding.


 Sometimes a municipality may identify a good project at a location for which the municipal government has no jurisdiction (i.e., a privately-owned business or residential structure). FEMA allows your municipality to apply on behalf of certain property owners. Your actions would be to:

- Meet with the facility owner to advise them of the problem.
- Support the facility owner to identify feasible alternatives to mitigate the problem (this may require a consultant/engineer to conduct a detailed evaluation of the site and specific construction details of the facility).
- If requested by the facility owner, apply on the owner's behalf for federal mitigation project funding for the most cost-effective mitigation alternative (albeit through local operating budgets, or if needed through funding streams at the state or federal levels).

 Under some FEMA grant funding streams, studies are eligible components of a larger mitigation project (where completion of the project is guaranteed regardless of study findings), but studies alone are not fundable mitigation projects. Conducting a study may be one of your actions, but FEMA mitigation project funding streams are not viable sources of outside funding for this type of activity.

 Large scale structural projects such as levees and floodwalls are typically not eligible under FEMA mitigation project funding streams unless there is a critical facility within the protected area.

 Your municipality can say that it will move forward with a project contingent upon local and/or grant funding being secured.

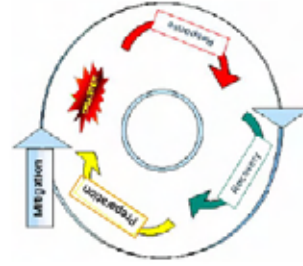
 If large scale or other mitigation measures are being considered in your area for implementation by another agency (such as the Army Corps of Engineers), bear in mind that the full completion of such projects is never guaranteed and often can take many years. Projects and studies are often contingent upon:

receiving funding in annual budget appropriations; receiving concurrence of study findings at various points in the process from stakeholders; the ability to purchase any lands needed for the project; and the local community's ability to fund any matches required for the various parts of the project. In such cases, a jurisdiction must consider whether or not it can accept the risk of damage if such projects do not come to fruition, or during the interim period before they are completed.

One of the benefits of having a FEMA-approved hazard mitigation plan is that your jurisdiction will be eligible to apply to FEMA for hazard mitigation project funding. Thus, while a jurisdiction could select virtually any mitigation action, it would seem to be in your best interest to incorporate at least one or more actions that are eligible types of projects under the FEMA funding streams for which your plan will make you eligible to apply for (PDM, HMGP, FMA, RFC, and SRL).

Additional information on FEMA's HMGP can be found in the HMGP Desk Reference at: www.fema.gov/library/viewRecord.do?id=1472

Additional information on FEMA's PDM, FMA, RFC and SRL programs can be found in the Unified HMA Program Guidance at: www.fema.gov/library/viewRecord.do?id=3309



Examples of types of projects that are generally eligible under FEMA funding streams (such as PDM, HMGP, FMA, RFC, SRL) include but are not limited to:

- Acquisition of real property for willing sellers and demolition or relocation of buildings to convert the property to open space use
- Elevation of flood prone structures
- Mitigation reconstruction
- Retrofitting structures and facilities to minimize damages from high winds, earthquake, flood, wildfire, or other natural hazards
- Development and initial implementation of vegetative management programs
- Minor flood control projects that do not duplicate the flood prevention activities of other Federal agencies
- Localized flood control projects, such as certain ring levees and floodwall systems, that are designed specifically to protect critical facilities
- Post-disaster building code related activities that support building code officials during the reconstruction process
- Localized minor flood reduction projects
- Dry floodproofing of residential property

- Dry floodproofing of nonresidential structures
- Stormwater management
- Infrastructure protection measures
- Vegetative management / soil stabilization
- Safe room construction

Examples of other types of activities related to mitigation from FEMA's Mitigation Planning How-To Guide #3 include:

- Building codes
- Density controls
- Design review standards
- Easements
- Environmental review standards
- Floodplain development regulations/zoning
- Forest fire fuel reduction
- Hillside development regulations
- Open space preservation
- Performance standards
- Setback regulations
- Special land use permits
- Stormwater management regulations
- Subdivision and development regulations
- Transfer of development rights
- Acquisition of hazard prone structures
- Construction of barriers around structures
- Elevation of structures

- Relocation out of hazard areas
- Structural retrofits (reinforcement/bracing, shutters, etc.)
- Hazard information centers
- Real estate disclosure
- Dune and beach restoration
- Forest and vegetation management
- Sediment and erosion control regulations
- Stream corridor restoration
- Stream dumping regulations
- Urban forestry and landscape management
- Wetlands development regulations
- Critical facilities protection
- Emergency response services
- Hazard threat recognition
- Hazard warning systems
- Health and safety maintenance
- Post-disaster mitigation
- Channel maintenance
- Dams and reservoirs
- Levees and floodwalls
- Safe rooms and shelter
- Seawalls and bulkheads

Additional information including descriptions of these actions can be found at: <http://www.fema.gov/library/viewRecord.do?id=1886>

appendix d worksheet job aids

Worksheet Job Aid #1: Alternative Mitigation Actions by Hazard

You can use this job aid when filling out Worksheet #1. This job aid shows you at a quick glance the type of actions that can address the selected seven hazards. A description of each action is included in the glossary in Appendix A.

Alternative Mitigation Actions	Prevention																
	Building codes	Coastal zone management regulations	Density controls	Design review standards	Easements	Environmental review standards	Floodplain development regulations	Floodplain zoning	Forest fire fuel reduction	Hillside development regulations	Open space preservation	Performance standards	Shoreline setback regulations	Special use permits	Stormwater management regulations	Subdivision and development regulations	Transfer of development rights
Floods	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■
Earthquakes	■		■	■	■	■				■	■	■		■		■	■
Tsunamis	■	■	■	■		■					■	■	■	■		■	■
Tornadoes	■			■		■						■				■	
Coastal Storms	■	■	■	■	■	■	■	■			■	■	■	■		■	■
Landslides	■		■	■	■	■			■	■	■	■	■	■		■	■
Wildfires	■		■	■	■	■			■	■	■	■		■		■	■



Alternative Mitigation Actions	Property Protection					Public Education & Awareness		
	Acquisition of hazard-prone structures	Construction of barriers around structures	Elevation of structures	Relocation out of hazard areas	Structural retrofits (e.g., reinforcement, flood-proofing, storm shutters, bracing, etc.)	Hazard information centers	Public education and outreach programs	Real estate disclosure
Floods	■	■	■	■	■	■	■	■
Earthquakes	■			■	■	■	■	■
Tsunamis	■	■	■	■	■	■	■	■
Tornadoes					■	■	■	■
Coastal Storms	■	■	■	■	■	■	■	■
Landslides	■			■		■	■	■
Wildfires	■			■		■	■	■

Alternative Mitigation Actions	Natural Resource Protection							
	Best Management Practices (BMPs)	Dune and beach restoration	Forest and vegetation management	Sediment and erosion control regulations	Stream corridor restoration	Stream dumping regulations	Urban forestry and landscape management	Wetlands development regulations
Floods	■		■	■	■	■	■	■
Earthquakes	■							
Tsunamis		■		■				
Tornadoes								
Coastal Storms	■	■		■				■
Landslides	■		■	■	■		■	■
Wildfires	■		■				■	■



Alternative Mitigation Actions	Emergency Services						Structural Projects				
	Critical facilities protection	Emergency response services	Hazard threat recognition	Hazard warning systems (community sirens, NOAA weather radio)	Health and safety maintenance	Post-disaster mitigation	Channel maintenance	Dams/reservoirs	Levees and floodwalls	Safe room/shelter	Seawalls/bulkheads
Floods	■	■	■	■	■	■	■	■	■		
Earthquakes	■	■	■	■	■	■					
Tsunamis	■	■	■	■	■	■			■		■
Tornadoes	■	■	■	■	■	■				■	
Coastal Storms	■	■	■	■	■	■	■		■	■	■
Landslides	■	■	■	■	■	■					
Wildfires	■	■	■	■	■	■					





appendix a glossary

Acquisition of hazard-prone structures	Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.
Base Flood Elevation (BFE)	Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as a standard for the National Flood Insurance Program.
Benefit-cost analysis (BCA)	Benefit-cost analysis is a systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.
Best Management Practices (BMPs)	Appropriate, site-specific management techniques that maximize the benefits of land and natural resource management actions, while minimizing impacts.
Bond	A debt obligation issued by states, cities, counties, and other governmental entities to raise money to pay for public projects, such as government facilities and infrastructure.
Building	A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheel and axles carry no weight.
Building codes	Regulations that set forth standards and requirements for the construction, maintenance, operation, occupancy, use, or appearance of buildings, premises, and dwelling units. Building codes can include standards for structures to withstand natural hazards.
Capability assessment	An assessment that provides an inventory and analysis of a community or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state's vulnerability to hazards or specific threats.
Channel maintenance	Ensuring that flood channels, storm sewers, retaining ponds, etc. do not become blocked by debris, sedimentation, overgrowth, or structural failure.
Coastal zone	The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas with direct drainage to the ocean.



Coastal zone management regulations	Regulations enacted to control growth and protect natural resources along coastlines. Under the federal Coastal Zone Management Act (CZMA) enacted in 1972, states and local governments adopt coastal zone management regulations designed to preserve, protect, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the wildlife dependent on those habitats.
Community Rating System (CRS)	CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of the policyholders in those communities are reduced.
Comprehensive plan	A document, also known as a "general plan," covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all of the physical elements that will determine the community's future development. This plan can discuss the community's desired physical development, desired rate and quantity of growth, community character, transportation services, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.
Construction of barriers around structures	Protective structures, such as berms and retaining walls, created by grading or filling areas with soil meant to keep flood waters from reaching buildings.
Critical facilities	Facilities vital to the health, safety, and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
Dams	Dams are artificial barriers which impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water. For a more detailed definition, see the National Dam Safety Program Act (as amended through P.L. 106-580, December 29, 2000).
Debris	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
Density controls	Regulations that manage growth by limiting the density of development, often expressed in terms of the number of dwelling units per acre. Density controls allow the community to plan in an orderly way for infrastructure.
Design review standards	Guidelines enacted by local governments requiring new development to meet certain appearance and aesthetic standards and establishing a process by which local officials can examine site plans or structure blueprints to assess compliance with those standards. Design review standards can help ensure new development blends with existing buildings and the landscape or meet other priorities, including hazard loss reduction.
Design standards	A set of guidelines pertaining to the appearance and aesthetics of buildings or improvements that governs construction, alteration, demolition, or relocation of a building or improvement of land.

Disaster Mitigation Act of 2000 (DMA 2000)	DMA 2000 (Public Law 106-390) is the latest legislation to improve the planning process. It was signed into law on October 30, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.
Dune and beach restoration	Actions taken to re-establish dunes and beaches that serve as natural protection against coastal flooding and storm surge. Dune and beach restoration activities consist of replenishing sand, re-planting protective vegetation, controlling or restricting foot and vehicles traffic, and constructing sand traps or wind barriers.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
Easements	Grant a right to use property, or restrict the landowner's right to use the property in a certain way.
Elevation of structures	Raising structures above the base flood elevation to protect structures located in areas prone to flooding.
Emergency response services	The actions of first responders such as firefighters, police, and other emergency services personnel at the scene of a hazard event. The first responders take appropriate action to contain the hazard, protect property, conduct search and rescue operations, provide mass care, and ensure public safety.
Eminent domain	The right of a government to appropriate private property for public use, with adequate compensation to the owner.
Environmental review standards	Guidelines established to ensure new development adheres to certain construction and site design standards to minimize the impact on the environment.
Erosion	Wearing away of the land surface by detachment and movement of soil and rock fragments during a flood or storm over a period of years, through the action of wind, water, or other geologic processes.
Federal Emergency Management Agency (FEMA)	Independent agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.
Fire-proofing	Actions taken on and around buildings to prevent the spread of fires.
Flood Mitigation Assistance (FMA) Program	A program created as part of the National Flood Insurance Reform Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurable structures, with a focus on repetitive loss properties.
Floodplain development regulations	Regulations requiring flood insurance and mandating certain design aspects of new or substantially improved structures that lie within regulated flood-prone areas. Current federal regulations through the National Flood Insurance Program require that, at a minimum, new residential buildings in the Special Flood Hazard Area have their lowest floor at or above the base flood elevation.



Floodplain zoning Zoning regulations that prescribe special uses for and serve to minimize development in floodplain areas.

Flood-proofing Actions that prevent or minimize future flood damage. Making the areas below the anticipated flood level watertight or intentionally allowing floodwaters to enter the interior to equalize flood pressures are examples of flood proofing.

Forest and vegetation management The management of forests and vegetation so they are resilient to landslides, high-winds, and other storm-related hazards.

Forest fire fuel reduction Minimizing fuel loads in forested areas by clearing excess ground cover and thinning diseased or damaged woodland to create healthier forests and to decrease the vulnerability to the devastation of forest fire.

General obligation bond A bond secured by the taxing and borrowing power of the municipality issuing it.

Goals General guidelines that explain what you want to achieve. They are usually broad policy statements, long-term in nature.

Hazard A source of potential danger or adverse condition.

Hazard information center Information booths, publication kiosks, exhibits, etc. that display information to educate the public about hazards that affect the jurisdiction and hazard mitigation activities people can undertake.

Hazard mitigation Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.

Hazard Mitigation Grant Program (HMGP) Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

Hazard profile A description of the physical characteristics of hazards and a determination of various descriptors, including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazard threat recognition The process of identifying possible hazards and estimating potential consequences.

Hazard warning systems Systems or equipment such as community sirens and National Oceanic Atmospheric Administration (NOAA) weather radios designed to provide advanced warning of an impending hazard. Warning systems allow communities to take protective actions before a hazard event occurs, including taking cover, finding shelter, or moving furniture, cars, and people out of harm's way.



HAZUS, HAZUS-MH	A GIS-based, nationally standardized, loss estimation tool developed by FEMA. HAZUS-MH is the new multi-hazard version that includes earthquake, wind, hurricane, and flood loss estimate components.
Health and safety maintenance	Sections of emergency response/operations plans that provide for the security of affected areas, including clean up and special precautions for each type of hazard (e.g., draining standing water after a flood, cautioning about aftershocks after an earthquake or successive tsunami waves, etc.).
Hillside development regulations	Site design and engineering techniques prescribed through regulations such as selective grading, drainage improvements, and vegetation clearance to eliminate, minimize, or control development on hillsides, thereby protecting the natural features of hillsides and reducing the likelihood of property damage from landslides.
Levees and floodwalls	Flood barriers constructed of compacted soil or reinforced concrete walls.
Loss estimation	Forecasts of human and economic impacts and property damage from future hazard events, based on current scientific and engineering knowledge.
Mitigation actions	Activities, measures, or projects that help achieve the goals and objectives of a mitigation plan.
National Flood Insurance Program (NFIP)	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations as indicated in 44 CFR §60.3.
Objectives	Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.
Open space preservation	Preserving undeveloped areas from development through any number of methods, including low-density zoning, open space zoning, easements, or public or private acquisition. Open space preservation is a technique that can be used to prevent flood damage in flood-prone areas, land failures on steep slopes or liquefaction-prone soils, and can enhance the natural and beneficial functions of floodplains.
Ordinance	A term for a law or regulation adopted by a local government.
Performance standards	Standards setting the allowable effects or levels of impact of development. Often used in conjunction with traditional zoning, the standards typically address specific environmental conditions, traffic, or stormwater runoff. Can also be imposed on structures in hazard areas to ensure they withstand the effect of hazards.
Planning team	A group composed of government, private sector, and individuals with a variety of skills and areas of expertise, usually appointed by a city or town manager, or chief elected official. The group finds solutions to community mitigation needs and seeks community acceptance of those solutions.
Policy	A course of action or specific rule of conduct to be followed in achieving goals and objectives.



Post-disaster mitigation	Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.
Post-disaster recovery ordinance	An ordinance authorizing certain governmental actions to be taken during the immediate aftermath of a hazard event to expedite implementation of recovery and reconstruction actions identified in a pre-event plan.
Post-disaster recovery planning	The process of planning those steps the jurisdiction will take to implement long-term reconstruction with a primary goal of mitigating its exposure to future hazards. The post-disaster recovery planning process can also involve coordination with other types of plans and agencies, but it is distinct from planning for emergency operations.
Private activity bond	A bond whose interest may or may not be federally taxable. Under the Internal Revenue Code, private activity bonds are described generally as any bond: (1) of which more than 10% of the proceeds is to be used in a trade or business of any person or persons other than a governmental unit, and which is to be directly or indirectly repaid, or secured by revenues from, a private trade or business; and (2) in which an amount exceeding the lesser of 5% or \$5 million of the proceeds is to be used for loans to any person or persons other than a governmental unit. Certain private activity bonds are tax exempt when used to finance private water, wastewater, and multifamily housing projects.
Public education and outreach programs	Any campaign to make the public more aware of hazard mitigation and mitigation programs, including hazard information centers, mailings, public meetings, etc.
Real estate disclosure	Laws requiring the buyer and lender to be notified if a property is located in a hazard-prone area.
Regulation	Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.
Relocation out of hazard areas	A mitigation technique that features the process of demolishing or moving a building to a new location outside the hazard area.
Reservoirs	Large water storage facilities that can be used to hold water during peak runoff periods for controlled release during off-peak periods.
Resources	Resources include the people, materials, technologies, money, etc., required to implement strategies or processes. The costs of these resources are often included in a budget.
Retrofitting	See definition for structural retrofitting.
Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Safe room/shelter	A small interior room constructed above grade and used to provide protection from tornadoes and other severe storm events. Bathrooms and large closets often double as safe rooms.
Seawalls/bulkheads	Vertical coastal walls that are built and designed to protect buildings against shoreline erosion. May also protect against storm surge.
Sediment and erosion control regulations	Regulations that stipulate the amount of sediment and erosion that is acceptable for land undergoing development.
Shoreline setback regulations	Regulations that establish a minimum distance between the existing shoreline and buildable areas.
Special tax bond	A bond secured by the pledge of a specific special tax.
Special use permits	Permits granted by local governments for land uses that have the potential for creating conflicts with uses on adjacent properties.
Stakeholder	Individual or group that will be affected in any way by an action or policy. Stakeholders include businesses, private organizations, and citizens.
State Hazard Mitigation Officer (SHMO)	The representative of state government who is the primary point of contact with FEMA, other state and federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
Storm water management regulations	Regulations governing the maintenance and improvement of urban storm water systems and the implementation of land treatment actions to minimize the effects of surface water runoff. Land treatment actions include maintenance of vegetative cover, terracing, and slope stabilization.
Strategy	Collection of actions to achieve goals and objectives.
Stream corridor restoration	The restoration of the areas bordering creeks, including the stream bank and vegetation.
Stream dumping regulations	Regulations prohibiting dumping in the community's drainage system, thereby maintaining stream carrying capacities and reducing the possibility of localized flooding.
Structural retrofitting	Modifying existing buildings and infrastructure to protect them from hazards.
Subdivision	The division of a tract of land into two or more lots for sale or development.
Subdivision and development regulations	Regulations and standards governing the division of land for development or sale. Subdivision regulations can control the configuration of parcels, set standards for developer-built infrastructure, and set standards for minimizing runoff, impervious surfaces, and sediment during development. They can be used to minimize exposure of buildings and infrastructure to hazards.



Taxation	Taxes and special assessments can be an important source of revenue for governments to help pay for mitigation activities. The power of taxation can also have a profound impact on the pattern of development in local communities. Special tax districts, for example, can be used to discourage intensive development in hazard-prone areas.
Transfer of development rights (TDR)	A growth management technique through which development rights are transferred from a designated "sending" area to a designated "receiving" area. The sending area is generally prohibited from development and the receiving area is a targeted development area that can be built at a higher density.
Urban forestry and landscape management	Forestry management techniques that promote the conservation of forests and related natural resources in urbanized areas, with a focus on obtaining the highest social, environmental, and economic benefits.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions.
Wetlands development regulations	Regulations designed to preserve and/or minimize the impact of development on wetlands.
Wind-proofing	Modification of design and construction of buildings to withstand wind damage.
Zoning	The division of land within a local jurisdiction by local legislative regulation into zones of allowable types and intensities of land uses.
Zoning or land use map	A map that identifies the various zoning district boundaries and the uses permitted by a zoning ordinance within those boundaries.
Zoning ordinance	Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.



SECTION 7 - ACTION ITEM EVALUATION AND PRIORITIZATION

As stated in Section 6, Core Planning Group members analyzed the full range of possible actions identified in Table 6.1 according to this three-step process:

1. First, CPG members evaluated the types of actions in Table 6.1 against the hazards identified in their community (as presented in Section 3e). FEMA Region 2 requires that actions addressing each identified hazard (regardless of the degree of risk) shall be included in each local municipal mitigation strategy / action plan for each municipality.
2. Next, Core Planning Group Members conducted a **preliminary analysis** of each action type in Table 6.1, considering the action item in relation to the results of the risk assessment and unique local considerations to identify a subset of preferred action items that would be analyzed in more detail. The subset of preferred action items for each municipality is included in **Appendix D** as listed on each of the municipal prioritization worksheets.
3. Finally, for the subset of preferred action items, Core Planning Group Members conducted a **detailed analysis and prioritization** using FEMA's STAPLEE approach.

This plan section speaks to Step 3 of the process outlined above, documenting the detailed analysis of preferred potential actions and their prioritization as undertaken during a working session of the Core Planning Group on October 19, 2011 and subsequently by individual JATs.

Detailed Analysis of Preferred Potential Actions and their Prioritization

During the working session, CPG members continued **detailed analysis** and prioritization of the subset of preferred action items. In order to further evaluate and ultimately prioritize the subset of preferred mitigation actions that were identified in the last step (that is, identified after the preliminary analysis discussed in Section 6), participants identified the **benefits** and **costs** of each preferred action using a planning concept called "STAPLEE". FEMA Guidance recommends that their "STAPLEE" method (considering each project's social, technical, administrative, political, legal, economic and environmental aspects) can be used to evaluate potential actions for the mitigation strategy/action plan, and also to prioritize those actions that the community selects as its mitigation actions. STAPLEE criteria are presented on the next page in **Table 7.1**. FEMA breaks these criteria down into a series of 23 detailed considerations. These considerations were discussed at the working session as part of the explanation of how to complete the prioritization exercise.

**Table 7.1
STAPLEE Criteria and Detailed Considerations**

<u>Criteria</u>	<u>Detailed Considerations</u>	<u>Sample Benefit and Cost Scenarios</u>
S <u>S</u> ocial	<ul style="list-style-type: none"> • Community acceptance • Affect on segment of population 	Is the action unfair to one section of the community over others? If yes, it is a social cost associated with the action. If the implementation of the action helps achieve a social goal of the community, it is a social benefit associated with the action.
T <u>T</u> echnical	<ul style="list-style-type: none"> • Technical feasibility • Long-term solution • Secondary impacts 	Is the action a good technical solution to the problem? If yes, it is a benefit associated with the action. The better the solution, the higher the benefits .
A <u>A</u> ddministrative	<ul style="list-style-type: none"> • Staffing • Funding allocation • Maintenance/operations 	Is the action difficult to implement because of the administrative problems associated? If yes, it is an administrative cost .
P <u>P</u> olitical	<ul style="list-style-type: none"> • Political support • Local champion • Public support 	Is the action politically favored? If yes, it is a benefit . If the action is likely to be politically unacceptable, it is a cost associated with the action.
L <u>L</u> egal	<ul style="list-style-type: none"> • State authority • Existing local authority • Potential legal challenge 	Are there perceived legal problems in implementing the action? If yes, it is a cost associated with the action.
E <u>E</u> conomic	<ul style="list-style-type: none"> • Benefit of action • Cost of action • Contributes to economic goals • Outside funding required 	Does implementing the action make economic sense? Are the costs too prohibitive? If yes, it is a cost associated with the action.
E <u>E</u> nvironmental	<ul style="list-style-type: none"> • Effect on land/water • Effect on endangered species • Effect on HAZMAT/waste sites • Consistent with community environmental goals • Consistent with federal laws 	Does the action have adverse environmental effects? If yes, it is a cost associated with the action.

Jurisdictions conducted a **detailed analysis of their preferred action items** by rating the overall benefits and costs of each action against the STAPLEE criteria identified above according to FEMA How-To # 386-5 STAPLEE Method B (modified). Using this methodology, to determine overall “**benefits**” for a certain action, each jurisdiction considered qualitatively the individual social, technical, administrative, political, legal, economic, and environmental benefits for the action and then indicated whether the net benefits, overall, could be characterized as high, medium, or low. To determine overall “**costs**” for a certain action, each jurisdiction considered qualitatively individual social, technical, administrative, political, legal, economic, and environmental costs for that action and then indicated whether the net costs, overall, could be characterized as high, medium, or low. These overall ‘**benefits**’ and ‘**costs**’ were noted on the worksheet, and the jurisdictions concluded by prioritizing each preferred action based on its overall benefits and costs.

It is important to note that a modified version of FEMA How-To #386-5 STAPLEE Method B was used. Because FEMA 386-5 included sample methodologies for applying a weighted score for only the two most complex STAPLEE methodologies (Methods C and D) but not for the more straightforward Method B, the consultant guided the CPG through a slightly modified Method B which used the methodology as presented in FEMA 386-5, but with a special weight placed on three factors: ease of implementation, achievement of multiple mitigation objectives, and how quickly the action can be implemented. During future plan updates, the CPG will reevaluate FEMA How-To #5 to determine if the currently selected

modified Method B continues to be deemed most appropriate for this planning project, or if a collective desire exists amongst CPG members to switch to one of the more complex Methods C or D.

Since a qualitative approach was taken for the evaluation and prioritization of mitigation actions, jurisdictions were permitted to apply their own internal weightings to the costs and benefits of actions under each category, hence on the completed worksheets the overall priority of an action may not reflect a straightforward arithmetic comparison of its total “benefits” and total “costs”.

All action items not selected for prioritization by a given community after considering the STAPLEE factors received a low priority. In the future, communities may still seek to pursue other actions which they evaluated but did not select for prioritization at this time, including but not limited to those discussed in Section 6 (and associated studies, funding, etc. for these actions).

In addition to hazard mitigation projects, FEMA requires that each jurisdiction evaluate a set of actions specifically aimed at continuing participation in and compliance with FEMA’s National Flood Insurance Program (per FEMA guidance released in July 2008, Part 201.6(c)(3)(ii)). These actions include updating floodplain management ordinances to comply with the latest FEMA regulations and adopted flood maps, additional employment/training of staff to enforce the ordinances, and participation in FEMA’s Community Rating System (CRS).

Appendix D contains a detailed analysis and prioritization worksheets (STAPLEE) completed by each participant for their selected actions.

Appendix F contains prioritization and implementation strategy worksheets for those actions specifically related to continued and/or enhanced compliance with FEMA’s National Flood Insurance Program. During subsequent plan updates, jurisdictions should consider FEMA’s new Toolkit file, A Guide to NFIP Requirements (“4-strat-3-nfip-requirements”), provided herein at the end of Appendix F. Jurisdictions with questions about the NFIP, or who are seeking information about the procedure to join or rejoin the NFIP, should contact NYSDEC State NFIP Coordinator, Bill Nechamen at 518-402-8146 and/or FEMA Region 2, Chief of Floodplain Management & Flood Insurance Branch, Mary Colvin at 212-680-3622.

Appendix N presents a summary of each jurisdiction’s progress on their local mitigation efforts, describing the status of actions in the previous plan by identifying those that have been completed or not completed; and, for actions not completed, describing whether the action is no longer relevant or whether it will be included in the updated plan.

Note that overall priorities in the County have not changed since preparation of the last plan, though the individual list of actions to be pursued has expanded dramatically.

Note to the reviewer: The next section in this plan, entitled “Implementation Strategy,” will expand upon the prioritization step by identifying the hazard addressed, if the action applies to new and/or existing assets, the primary agency responsible for action item completion, any existing local planning mechanisms through which the action item will be implemented, target date for completion, estimated cost, and funding source.

SECTION 8 - IMPLEMENTATION STRATEGY

This section includes information regarding the process followed by participating jurisdictions to implement and administer their selected mitigation actions and projects for reducing the effects of each hazard. It sets forth the subset of mitigation actions to be included in the mitigation strategy/action plan for each community, including how the actions will be prioritized, implemented and administered by the local jurisdictions.

The implementation strategy (“action plan”) developed by participants at the October 19, 2011, Working Session for selected and prioritized action items is community-specific for each jurisdiction. Participants were asked to develop an implementation strategy for preferred action items they selected and prioritized (in Sections 6 and 7) for their respective communities using worksheets developed specifically for this task. The implementation strategy developed by each participant was based on each participant’s qualitative analysis of social, technical, administrative, political, legal, economic, and environmental benefits and costs associated with each selected action.

Each community addressed how their preferred actions will be implemented and administered.

For each selected and prioritized action item, participants identified the hazard addressed, if the action applies to new and/or existing assets, the primary agency responsible for action item completion, any existing local planning mechanisms through which the action item will be implemented, target date for completion, estimated cost, and funding source. For jurisdictions which provided qualitative project costs (“high/medium/low”), a range of dollar values for these designations will be provided at the first plan update (or more detailed, quantitative cost estimates if possible).

All action items not selected for prioritization by a given community after considering the STAPLEE factors received a low priority. In the future, communities may still seek to pursue other actions which they evaluated but did not select for prioritization at this time, including but not limited to those discussed in Section 6 (and associated studies, funding, etc. for these actions).

All participating jurisdictions who will be adopting this plan will undertake the following high priority public outreach actions at a minimum, as part of their plan maintenance obligation:

- Each participating jurisdiction will add a link on their jurisdiction’s web page to the County mitigation planning website, if they have not already done so as part of the plan development process.
- Participating jurisdictions will conduct annual interviews and/or smaller meetings with civic groups, the public and other stakeholders. This will be accomplished through incorporating discussion of the mitigation plan into other regularly attended meetings.
- Participating jurisdictions will consider annual flyers, newsletters, newspaper advertisements, and Radio/TV announcements, and will implement some or all of the above at the discretion of the jurisdiction.

Appendix E contains completed worksheets for community-specific implementation strategies. The action items ultimately selected address every profiled hazard, for every participating jurisdiction.

Appendix F contains prioritization and implementation strategy worksheets for those actions specifically related to continued and/or enhanced compliance with FEMA’s National Flood Insurance Program.

SECTION 9 - PLAN MAINTENANCE

A formal plan maintenance process for monitoring, evaluating, and updating the Hazard Mitigation Plan must take place to ensure that the Plan – and specifically the mitigation strategy – remains current and relevant. Updates are required every five years from the date the plan is approved¹. Regularly scheduled evaluations during the five-year cycle are important to assess the effectiveness of the program and to reflect changes that may affect mitigation priorities, and a process must be undertaken to keep the public engaged throughout the plan’s ongoing implementation. As part of this first Plan Update, ECDES has reviewed the 2005 plan maintenance procedure, and has opted to pursue a very similar strategy for the next five years (2015 to 2020) though some changes have been made to account for both expressed municipal preferences for a slightly modified approach in some areas, and minor differences in the FEMA guidance since the initial plan was prepared.

The ECDES will continue to take the lead role in coordinating the overall plan maintenance effort. Mr. Gregory Butcher, Deputy Commissioner of the ECDES and Coordinator for this mitigation planning project, will oversee the overall plan maintenance process with direct assistance from Mr. James Glass, Emergency Services Coordinator, who has been directly involved with the County’s hazard mitigation planning efforts since 2002. ECDES will take the lead on plan monitoring and evaluation steps (with help from the rest of the County Mitigation Planning Jurisdictional Assessment Team), and any required plan updates (with help from Mr. Butcher and the rest of the County Mitigation Planning Jurisdictional Assessment Team). Each CPG member will take the lead role on plan maintenance activities for their respective jurisdiction². **Details of County and municipal responsibilities with regard to plan maintenance and integration are described in the remainder of this section.**

Monitoring the Plan

An important step in any mitigation planning process is to document the method by which the Hazard Mitigation Plan will be monitored throughout each future five-year planning cycle. Every participating jurisdiction should regularly review the progress of activities outlined in their respective Implementation Strategies (mitigation action plans and measures) to see if they are on-track for meeting previously targeted project milestones and completion dates.

When the Erie County plan was first approved in 2005, its plan monitoring strategy included a biennial review of mitigation action plan progress, stating that Local Disaster Coordinators from each participating jurisdiction would review their respective municipal action plans at least every two years, with an updated copy kept on file at ECDES. During the first plan update process, ECDES and participating jurisdictions have reviewed this activity and indicated that it was completed on an ongoing basis throughout the first planning cycle. The planning team considers the activity to still be relevant, and has indicated that they would like to continue this plan monitoring activity in future planning cycles, beginning two years from the date of FEMA’s approval of the Final plan update in 2015.

FEMA encourages the use of **Work Progress Monitoring Reports** to document monitoring activities. Entities responsible for implementing mitigation actions (as identified in the Implementation Strategy for

¹ After FEMA completes its plan review and determines that all requirements have been adequately addressed, it issues a determination of “Approvable Pending Adoption”. Participating jurisdictions then each move forward with formally adopting the plan. For multi-jurisdictional plans, FEMA considers the plan approval date to be the date of the first jurisdictional adoption.

² Many jurisdictions have more than one individual CPG member. In completing the Statement of Authority to Participate (discussed in Section 1), each jurisdiction designated a primary CPG representative as well as an alternate. For plan maintenance purposes, it is the person designated as the ‘primary representative’ who is responsible for shepherding plan maintenance activities.

the County and each participating jurisdiction) should consider using Work Progress Monitoring Reports to document this activity. Work Progress Monitoring Reports shall be the *FEMA How-To #4 (FEMA 386-4)*, *Worksheet #1, Progress Report* available on the FEMA web site at www.fema.gov. Using the FEMA Progress Reports will answer the following questions:

- the hazard mitigation action(s) that the agency is responsible for
- the supporting agencies/entities responsible for implementation;
- a delineation of the various stages of work along with timelines (milestones should be included);
- whether the resources needed for implementation, funding, staff time and technical assistance are available, or if other arrangements must be made to obtain them;
- the types of permits or approvals necessary to implement the action;
- details on the ways the actions will be accomplished within the organization;
- whether the duties will be assigned to agency staff or contracted out;
- the current status of the project; and
- identifying any issues that may hinder implementation.

These biennial reviews of project progress should be used by each participating jurisdiction to support overall mitigation project implementation, ensuring that projects do not fall between the cracks during the plan maintenance phase. Documentation of monitoring activities (i.e., the FEMA Work Progress Monitoring Reports) should be submitted to ECDES for their records and future use in subsequent plan updates.

On a case-by-case basis, ECDES will determine if site visits, phone calls, and/or meetings would be beneficial to supplement Work Progress Monitoring Reports. If so, ECDES will initiate the site visits/calls/meetings as applicable.

Evaluating the Plan

Post adoption, a mitigation plan should be evaluated on a regular basis in order to assess the effectiveness of the plan's implementation and to reflect changes that may affect the mitigation priorities.

When the Erie County plan was first approved in 2005, its plan evaluation strategy included an annual review of the plan by a committee representing all initial Planning Committee municipalities and agencies, who would review and re-evaluate the plans stated risks and hazards, evaluate the relevance of its goals and objectives, evaluate the effectiveness and appropriateness of its mitigation action plan and measures, and document the county's progress in accomplishing the plan's stated goals and objectives. During the first plan update process, ECDES and participating jurisdictions have reviewed this activity and indicated that it was completed on an ongoing basis throughout the first planning cycle. The planning team considers this activity to still be relevant, and has indicated that they would like to continue this plan evaluation activity in future planning cycles. However, they have opted to undertake this activity on a less frequent (biennial) basis, beginning two years from the date of FEMA's approval of the Final plan update in 2015.

To accomplish this objective, the Core Planning Group will convene once every two years for a **Biennial Plan Evaluation Meeting**. At each meeting, the Core Planning Group will examine data related to disasters that occur within the county. This data includes, but is not limited to financial records, current zoning laws, codes and land use plans. The results will be measured to ensure that mitigation activities/plans are effective. If such plans prove to be ineffective, such as high loss of life/injuries, elevated financial costs, etc., they shall be adjusted as necessary. They will also review Work Progress Monitoring Reports, and use the following criteria to evaluate the plan:

- do the goals and objectives address current and expected conditions?
- has the nature and magnitude of risks changed?
- are the current resources appropriate for implementing the plan?
- are there any implementation problems (such as technical, political and/or legal), or coordination issues with the other agencies and/or Committee members?
- have the outcomes occurred as expected?
- have the agencies and other Committee partners participated as proposed?; and
- where shortcomings are identified, what can be done to bring things back on track?

Following each Biennial Plan Evaluation Meeting, the ECDES will prepare meeting minutes summarizing the outcome of the evaluation meeting. ECDES will distribute meeting minutes to Core Planning Group members via email, and will post meeting minutes on the web site.

Updating the Plan

As part of the process to maintain FEMA mitigation funding eligibility, a plan update must always be submitted to NYSOEM/FEMA for their review. This must occur within five years of the plan's approval by FEMA (and during subsequent five-year cycles thereafter).

When the Erie County plan was first approved in 2005, its plan update strategy indicated that revisions made to the plan will be submitted for local legislative body approval, with the general public being involved to the same extent that they were included during the preparation of the initial plan. It also indicated that updates would be submitted to NYSOEM and FEMA after local legislative review. During the first plan update process, ECDES and participating jurisdictions have reviewed this activity and indicated that it was completed on an ongoing basis throughout the first planning cycle. The planning team considers this activity to still be relevant, and has indicated that they would like to continue this activity in future planning cycles (2015-2020, and beyond).

ECDES will take the lead on Plan updates, with support from the Core Planning Group members and the County Planning Department. ECDES will conduct Update Appraisals. During the Update Appraisal, ECDES will evaluate the current Plan, Biennial Progress Monitoring Reports, and Biennial Plan Evaluation Meeting Minutes. ECDES will conduct the Update Appraisals at 2.5 years from the date of FEMA's approval of the Final updated plan, and at the same point in time during subsequent five-year windows (i.e., from the date of FEMA's approval of the final plan, Update Appraisals will occur at Year 2.5, Year 7.5, Year 12.5, etc.). Year 2.5 has been identified as an optimal point for the Update Appraisals to ensure that sufficient time will be available to update the document within the five year cycle (including time for possible grant application submittal, review, and award; contractor selection if outside support is preferred; etc.); undertake the plan update process itself; modify the document; submit the updated document for FEMA's re-approval; and for local jurisdictions to formally adopt the updated plan.

Plan updates will not only involve a comprehensive review and evaluation of each section of the plan, but also a discussion of the results of evaluation and monitoring activities detailed in the Plan Maintenance section of the previously approved plan. Plan updates may validate the information in the previously approved plan, or may involve a major plan rewrite. A plan update cannot be an annex referring to the previously approved plan; it must stand on its own as a complete and current plan.

Other criteria that will be considered during the update include:

- if changing situations have modified goals/objectives/actions and/or hazards;
- if additional information is available to perform more accurate vulnerability assessments;

- if it is determined that participating jurisdictions wish to be added to and/or removed from the Plan; or
- if it is determined that the Plan no longer addresses current and expected future conditions.

At the time of the update, ECDES shall consult with FEMA for the latest Guidance in place regarding plan updates to ensure that the latest criteria are addressed in the update process.

ECDES will prepare an updated plan. Once the updated plan is prepared by ECDES at the completion of the plan update process involving all municipalities, ECDES will circulate the document to all plan participants via email to each jurisdiction's Core Planning Group members for their review and comment. Comments will be due back to ECDES within 14 days; lack of response will be assumed to indicate concurrence with the ECDES appraisal. Comments received which cannot be resolved remotely will trigger an Update Resolution Meeting of the Core Planning Group to resolve differences and develop a joint determination on how to modify the document.

Any plan updates will be released for public review and comment. The updated plan will be posted on the County web site, and made available in hard copy at the ECDES offices. Notification to the public will also be issued to this same effect, and interested parties will be given 30 days to provide comments to ECDES.

Public Participation in Plan Maintenance

As per 44 CFR Part 201.6 (c)(4)(iii) states, "[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process." To meet this requirement, the new Hazard Mitigation Plan should describe what opportunities the public will have during the plan's periodic review to comment on the progress made to date and on any proposed plan revisions.

When the Erie County plan was first approved in 2005, its strategy for public participation in plan maintenance indicated that to ensure and encourage continued public involvement, Disaster Coordinators and/or the Department of Emergency Services shall invite the public to review and comment on the plan at least yearly, with notification via various media outlets. It also indicated that local media would be used on a regular basis to encourage citizens to join any number of local emergency response/planning teams. These teams include, but are not limited to the Local Emergency Planning Committee, Erie County Haz Mat Organization, Citizen Corps, municipal planning committees, etc. During the first plan update process, ECDES and participating jurisdictions have reviewed these activities and indicated that they were completed on an ongoing basis throughout the first planning cycle. The planning team considers these activities to still be relevant, and has indicated that they would like to continue the activities in future planning cycles (2015-2020, and beyond).

The following array of activities has been developed in consideration of not only the regulations but also with an aim to invoke additional public participation, since limited public response was received during the plan development process despite opportunities that were presented. It has also been developed with an aim to build upon outreach activities to other stakeholders that was undertaken as part of the plan development process.

- ECDES will continue to maintain the mitigation planning website and document repositories, giving the public and other stakeholders 24 hour access to the plan.
- Each participating jurisdiction will add a link on their jurisdiction's web page to the County mitigation planning website (if they have not already done so as part of the plan's initial development or first update).

- ECDES will lead efforts to prepare an annual fact sheet on the plan. This fact sheet will be submitted via email to Core Planning Group members for posting on community notice boards, at a minimum, and preferable supplemented with distribution at meetings as applicable. ECDES will post the fact sheet on the county mitigation plan web site.
- ECDES will lead efforts to prepare a survey for the public and other stake holders which will be posted on the County mitigation planning web site and in document repositories. Survey forms will be shared with participating jurisdictions for their use, as well. All feedback will be directed to ECDES as a central location. Survey feedback will be a topic of discussion at Biennial Plan Evaluation Meetings.
- Participating jurisdictions will conduct annual interviews and/or smaller meetings with civic groups, the public and other stakeholders. This will be accomplished through incorporating discussion of the mitigation plan into other regularly attended meetings.
- Participating jurisdictions will consider annual flyers, newsletters, newspaper advertisements, and radio/TV announcements, and will implement some or all of the above at the discretion of the jurisdiction.
- ECDES will continue to maintain a telephone hotline service where interested parties are directed to call to ask questions or submit feedback regarding the plan.
- Participating jurisdictions will consider offering working groups by topic area (such as land use, hazard, mitigation action, etc.) if deemed necessary based upon feedback obtained during the plan maintenance cycles.
- Participating jurisdictions will each conduct an annual town hall meeting on the progress of the mitigation plan implementation. This could be its own, separate meeting, or incorporated into another regularly scheduled meeting.
- Since there was limited response to the initial outreach efforts, CPG members will continue outreach to other stakeholders during the plan maintenance phase, and will document these efforts in Section 1 of any plan updates. This will include consideration of direct outreach to inform and involve additional stakeholders in the plan development process.

Plan Integration

As per 44 CFR Part 201.6(c)(4)(ii), “[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.”

When the Erie County plan was first approved in 2005, its strategy for plan integration indicated that plan would be considered by each municipality prior to the adoption of new/amended zoning laws, land use plans, master plans, public safety statutes and community police and fire prevention activities with Local Disaster Coordinators serving as an advocate of this process within their respective municipal governments. During the first plan update process, ECDES and participating jurisdictions have reviewed these activities and indicated that they were completed on an ongoing basis throughout the first planning cycle. The planning team considers these activities to still be relevant, and has indicated that they would like to continue these activities in future planning cycles (2015-2020, and beyond).

The following capabilities in relation to mitigation planning and opportunities to integrate the mitigation plan into daily activities have been identified. Progress with regard to Plan Integration will be on the agenda for each Biennial Plan Evaluation Meeting.

Participating jurisdictions currently use comprehensive land use planning, capital improvements planning and building codes to guide and control development. After the Hazard Mitigation Plan Update is formally adopted, these existing mechanisms will have hazard mitigation strategies integrated into them, as follows:

- Within six months after adoption of the Hazard Mitigation Plan, Core Planning Group members for each participating jurisdiction will issue a letter to each of its community's department heads to solicit their support and explore opportunities for integrating hazard mitigation planning objectives into their daily activities.
- Many participating jurisdictions have Master Plans, General or Comprehensive Plans. In participating jurisdictions where Master Plans, General or Comprehensive Plans exist, Core Planning Group members will work with their respective planning departments to educate them on the Hazard Mitigation Plan and encourage that on the next updates of such plans, hazard mitigation for natural hazards is addressed.
- Many participating jurisdictions have local building departments responsible for building code enforcement and review of site plans. Local jurisdictions enforce the state-adopted IBC. In these communities, Core Planning Group Members will coordinate with their respective building departments to ensure that they have adopted and are enforcing the minimum standards established in the State-adopted IBC.
- Many participating jurisdictions participate in FEMA's National Flood Insurance Program and as such have local floodplain management ordinances. In these communities, Core Planning Group Members will coordinate with their respective Floodplain Administrator to determine if enforcement beyond FEMA minimum requirements would be prudent for the community.
- In participating jurisdictions with local zoning ordinances, Core Planning Group members will work with their zoning boards to educate them on the Hazard Mitigation Plan and encourage consideration of low occupancy, low-density zoning in hazard areas, when practicable.
- Participating jurisdictions will consider working with their department or agency heads to revise job descriptions of government staff to include mitigation-related duties could further institutionalize hazard mitigation. This change would not necessarily result in great financial expenditures or programmatic changes. For example, the How-To presents the following language which could be considered for adding into job descriptions for a community planner, floodplain manager, emergency manager, building code official, or water resources engineer in the Public Works Department:

Knowledge, Skills and Abilities

Knowledge. Knowledge of the principles of emergency management, specifically hazard mitigation. Knowledge of the principles and practices of sustainable development and how it is incorporated into hazard mitigation planning. Knowledge of FEMA's pre- and post-disaster mitigation programs, as well as other federal agency programs (HUD, EPA, SBA) that provide technical and/or financial assistance for implementing pre- or post-disaster mitigation planning. Knowledge of private/non-governmental programs that can support reconstruction and mitigation strategies.

Skills. Consensus building and team building, communication (verbal and written), and interpersonal skills.

Abilities. Ability to apply planning principles and tools to the goals of hazard loss reduction.

- Instead of solely relying on funding from hazard mitigation programs or other external sources of grant monies, participating jurisdictions will consider a line item for mitigation project funding in their capital or operational budgets. Having a line item in these budgets may not guarantee funding every year, but it is certainly easier to get the money allocated if it is already there. Examples include:

- A revolving fund to finance a buyout program.
 - A low-interest loan program to fund retrofits.
- Participating jurisdictions with comprehensive plans will add a hazard element to the comprehensive plan as one of the most effective mechanisms to institutionalize hazard mitigation for new construction. A primary benefit of combining these processes is that they both influence the location, type, and characteristics of physical growth, specifically buildings and infrastructure. While planning in and of itself may not be regulatory, it uses regulatory mechanisms (zoning, development ordinances, etc.) for implementing goals and objectives. Additionally, in many parts of the country, the comprehensive planning process is an established activity that is already familiar to the public, and it usually generates a great deal of interest and public participation.

Examples of using existing resources to accomplish mitigation, as excerpted from FEMA's How-To #4, include:

- Core Planning Group members will work with their local Department of Public Works to adopt more rigorous procedures for inspecting and cleaning debris from streams, ditches, and storm drain systems. For example, instead of cleaning only after storms or complaints from citizens, or on an annual basis, the Department could require inspections of streams and ditches at least twice per year and after a significant rain event.
- Participating jurisdictions will seek to add hazard vulnerability to subdivision and site plan review criteria and incorporate any necessary actions at the planning stage.
- ECDES will seek to identify a community conservation society or other interested voluntary organization could perform inventories of historic sites in hazard areas that might require special treatment to protect them from specific hazards.
- Partners and nonprofit organizations and businesses can assist the planning team in a number of ways, by including lending expertise, discounted materials, staff or volunteer time, or meeting space. The planning team can in response offer these entities opportunities for greater public exposure and thus, greater recognition. The planning team can inform partners about the hazards they potentially face the ways they can mitigate these hazards and how their staff can mitigate hazards at home. Participating jurisdictions will reach out to partner groups in their communities to identify those who may be willing to donate goods or services and create a database of contact information and indicated goods/services.
- Citizens have an ongoing role to play in project implementation. The planning team should actively seek volunteers to help implement programs and activities. Knowledgeable citizens can also be recruited to provide expertise in specific subject areas. The more the team involves people in implementing the plan, the greater the support it will receive.
- State agencies can lend their time, expertise and funds to the implementation of hazard mitigation projects. ECDES will make sure the planning team's list of state contacts is very broad, as the resources of one state agency may be unknown to another. ECDES will assist participating jurisdictions in reaching out to state agencies for support.
- Colleges and universities can provide technical expertise to projects that may require Geographic Information System (GIS), engineering, planning or other technical assistance. They can also provide meeting space, laboratories and other logistical support. ECDES will assist participating jurisdictions in reaching out to educational institutions for support.
- Community libraries are an excellent source of information and services, including volunteers. Participating jurisdictions will meet once each five years with their local library staff members to discuss the mitigation plan so they are well-versed in its purpose and understand where to direct interested parties for more information, to provide feedback, or to become involved.

SECTION 10 - FOR MORE INFORMATION

If you have any questions or comments on the Multi-Jurisdictional Hazard Mitigation Plan Update for Erie County, New York, additional information can be obtained by contacting:

Gregory Butcher, Deputy Commissioner
Erie County Department of Emergency Services
45 Elm Street
Buffalo, New York 14203
Phone: (716) 858-2944
E-Mail: gregory.butcher@erie.gov

For jurisdiction specific information, it is recommended that interested parties contact the individuals identified as representatives of the jurisdictions in **Appendix G** of this plan.

Plan information is also maintained continuously on the County web site at. It can be found online at: <http://www2.erie.gov/disaster/> and then clicking on “Multi Hazard Mitigation Plan.”

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